SIEMENS

SIMATIC PC

Panel PC 670 Computing Unit

Equipment Manual

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This manual is only valid for computing units with Order No. 6AV77xx-...

Release 04/02

Safety Guidelines

This manual contains notices which you should observe to ensure your own personal safety, as well as to protect the product and connected equipment. These notices are marked as follows according to the level of danger:

Danger

indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

Warning

indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

Caution

used with the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

Caution

used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in property damage.

Notice

indicates that unwanted events or status can occur if the relevant information is not observed.

Note

draws your attention to particularly important information on the product, handling the product, or to a particular part of the documentation.

Qualified Personnel

Equipment may be commissioned and operated only by **qualified personnel**. Qualified personnel within the meaning of the safety notices in this manual are persons who are authorized to commission, ground and identify equipment, systems and circuits in accordance with safety engeneering standards.

Correct Usage

Please note the following:

Warning

The device may only be used for the application cases specified in the catalog and the technical description and may only be used in combination with third-party equipment and components recommended or approved by Siemens.

Appropriate transport, and appropriate storage, installation and assembly, as well as careful operation and maintenance, are required to ensure that the product operates perfectly and safely.

Trademarks

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Impressum

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Exclusion of Liability

We have checked the content of this publication for compliance with the described hardware and software. However, discrepancies cannot be excluded, with the result that we cannot guarantee total compliance. The information in this publication is, however, checked regularly, and any necessary corrections are included in the following editions. We welcome any suggestions for improvement.

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Technical data subject to change.

For your notes

Preface

Purpose

The SIMATIC Panel PC 670 Computing Unit equipment manual is part of the SIMATIC HMI documentation.

It provides information for operators, mechanics, project engineers and maintenance personnel about the computing unit's installation, functionality, operation and technical structure.

Documentation

- SIMATIC Panel PC 670, Computing Unit Equipment Manual (this document)
  SIMATIC Panel PC 870, Computing Unit Equipment Manual

  The equipment manual contains information on extension options for the computing unit, on the configuration, error diagnostics and the hardware.
- SIMATIC Panel PC 670/870 Operating Unit Equipment Manual

  The equipment manual contains information on operating the operating unit, error diagnostics and the hardware.
- SIMATIC Panel PC 670/870, Installation Guide

  This Installation Guide contains the information on the mechanical and electrical installation of the Panel PC 670/870 and starting it up.

All the equipment manuals mentioned are supplied with the Panel PC 670/870 electronically in PDF format on the Documentation & Drivers CD and are available in German, English, French, Italian and Spanish.

Target groups include installation engineers as well as service and maintenance technicians.

Notation

The following conventions are used in this manual:

`Motor on`	Text that is displayed on the operating unit is printed in Courier type face.
`Variable`	Symbolic names that stand for variable quantities that appear on the screen are printed in Courier italic type face.
Screens	Selectable functions are printed in italic type face.
ESC	Names of keys and buttons are shown in a different type face.

History

Release	Comments
03/00	Initial release of the SIMATIC Panel PC 670 – Computing Unit equipment manual.
12/01	Extension to include ”Remote mount form factor” option of the SIMATIC Panel PC 670 – Computing Unit equipment manual.
04/02	Technical update to the SIMATIC Panel PC 670 Computing Unit equipment manual

Trademarks

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- SIMATIC Panel PC®
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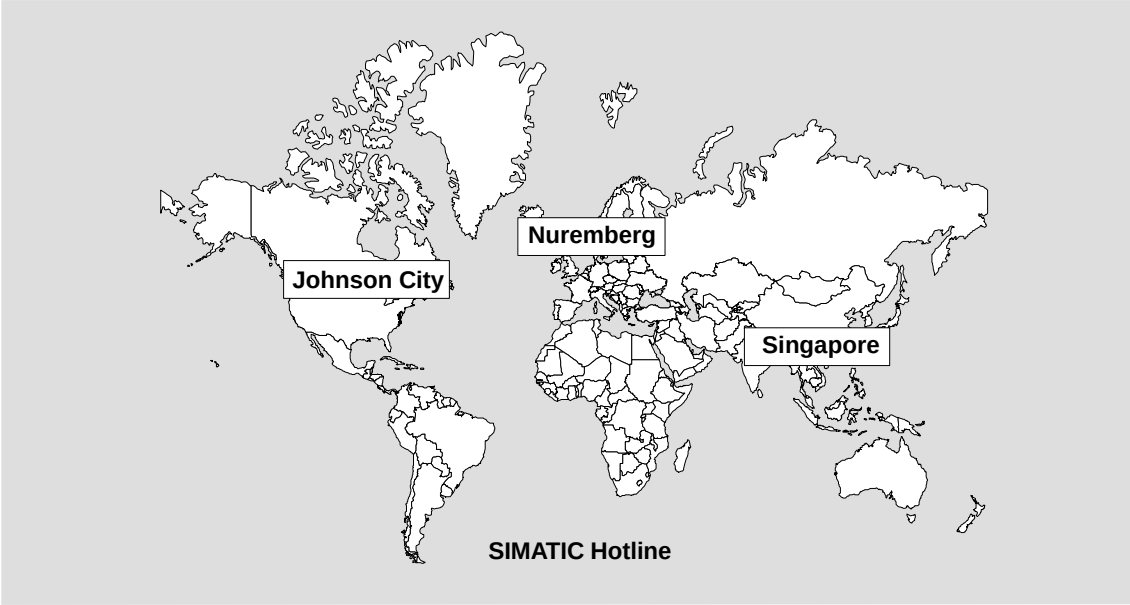

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The languages spoken by the SIMATIC Hotlines are generally German and English, the Authorization Hotline is also provided in French, Italian and Spanish.

SIMATIC Customer Support Online Services

The SIMATIC Customer Support team offers you substantial additional information about SIMATIC products via its online services:

- General current information can be obtained
  - in the Internet unter
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- Current Product Information leaflets, FAQs (Frequently Asked Questions), Downloads, Tips and Tricks can be obtained
  - in the Internet under
    http://www.siemens.com/automation/service&support

Training Center

Siemens offers a number of training courses to familiarize you with the SIMATIC S7 automation system. Please contact your regional training center or our central training center in D 90327 Nuremberg, Germany for details.

Telephone: +49 (911) 895–3200

Internet: http://www.sitrain.com

E-Mail: info@sitrain.com

Other Sources of Assistance

In case of technical queries, please contact the Siemens representatives in the subsidiaries and branches responsible for your area.

The addresses can be found:

- in the Siemens Catalogue ST 80
- in the Internet under
  http://www.siemens.com/automation/partner
- in the Interactive Catalogue CA01
  http://www.siemens.com/automation/ca01

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Product Overview

1

Chapter Overview

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1.1 Advantages of the Computing Unit

Computing unit

The computing unit serves as a basic component for the PC-based HMI devices (Panel PC) and, within the scope of special configurations, as a basis for customized devices.

The computing unit is intended for use in industry as well as in the residential, business and commercial areas and can also be used in building system automation or in public facilities, in addition to industrial applications.

Quality

The computing unit is characterized by its high quality, which is attributable, for example, by:

- extensive climate, vibration and shock tests to ensure industrial compatibility;
- hotline, service, spare parts;
- compact dimensions;
- suitability for use in a wide ambient temperature range;
- a design that is easy to service and maintain.

Installation

The computing unit can be installed in virtually all the usual locations (refer to Chapter 2.2).

There are anchorage points on both of the longs sides for securing the computing unit. Mounting brackets are screwed onto these anchorage points.

Constructional designs

The SIMATIC Panel PC 670/870 is available in two different designs:

1. Panel PC in a centralized design (computing unit and operating unit are integrated),
2. or as a Panel PC in decentralized design (computing unit and operating unit spatially separated, refer to Chapter 8).

Software equipment

The computing unit is equipped with software which allows it to be used universally. It contains the operating system Windows NT 4.0, Windows 98 or Windows 2000.

The computing unit additionally allows the use of:

- SIMATIC supplementary software
- software from the entire world of automation
- software from the PC world

Advantages of the computing unit

- The computing unit is rugged in design and its functions make it particularly suitable for use on site under harsh industrial conditions. It meets the specific requirements of an industrial environment, such as noise immunity, compliance with standards, ruggedness and continuous operation.
- Owing to the variable operating location and the many options for installation, the computing unit can be used virtually anywhere.
- Integrated on the computing unit are all the ports required for SIMATIC automation. Specifically, these are:
  - parallel port (LPT1)
  - serial ports (1x V.24, 1x V.24/TTY)
  - PS/2 keyboard interface
  - PS/2 mouse port
  - USB interface (2x computing unit, 1x operating unit)
  - MPI/L2-DP (max. 12 Mbit/s)
  - Cardbus interface, 1 slot (type I/II/III)
  - VGA interface for external monitor
  - LVDS interface for flat-screen display

1.2 Safety Notes

Caution

Please observe the safety notes on the back of the cover of this manual. Expansions to the Panel PC should only be carried out after having read Chapter 4 and the relevant safety notes.

This device complies with the safety requirements in accordance with IEC, VDE, EN, UL and CSA. If you have doubts about the approval of the installation in the intended location, please contact the service representative responsible for your area.

Notes on installation

If the device is brought to its operating location from a cold environment, condensation may occur. Before starting up, the device must be dry and, therefore, an acclimatization period of at least 12 hours is necessary.

Before installing and operating the device, please note the information on ambient conditions in the Appendix *Technical Data* and and on installing the device in Chapter 2.2. The device must be installed in such a way that it presents no danger of any kind (for example, by tipping over).

Ensure that the air vents are not obstructed and sufficient cooling air can be drawn in inside the device.

Warning

When assembling the systems, it is essential to maintain the permissible installation positions and angles (refer to Chapter 2.2).

If systems are installed at a non-approved installation location, the approvals to UL 1950, UL 508 and EN60950 are no longer valid!

Mains supply

When connecting the device, observe the relevant information provided in Chapter 2.

Never connect or disconnect power cables or data transmission lines during a thunderstorm.

In an emergency situation (for instance, damage to the housing, controls or power cable, penetration by liquids or foreign bodies), pull the power plug and contact the authorized service department.

When plugging in/out periphery connections (e.g. keyboard, mouse, printer), the SIMATIC Panel PC must have been switched off (not in the case of PC card and USB devices). Failure to do so can result in damage to the computing unit.

Notes for devices with AC power supply

The device is intended for connection to grounded power supply systems (TN networks to VDE 0100, Part 300, or IEC 364-3).

No provision is made for connection to non-grounded or impedance-grounded power supply systems (IT networks).

The power cable should comply with the safety guidelines of the country concerned.

Check to make sure that the rated voltage for the device corresponds to that supplied by the local power supply.

This device is equipped with a safety-tested power supply cable and may be connected only to a socket outlet with grounding contact.

Make sure that the socket outlet on the device or the socket outlet with grounding contact of the building wiring system is freely accessible and located as near to the device as possible.

To completely disconnect the PC from the mains power supply, you must pull the plug. This connection must be easily accessible. If the PC is to be installed in a cabinet, a central disconnector must be provided.

Note for devices with DC power supply

Devices with a DC power supply are considered open operating resources (right side of device); therefore, the assembly design must fulfill the fire protection housing requirements.

Warning

The device may only be connected to 24 V DC power supply networks which fulfill the requirements of a safe electrical low voltage (SELV).

The cable cross-section must be large enough so that, should a short circuit occur in the computing unit no damage is caused by the cable.

Country-Specific Notes

For the USA and Canada:

For operation in Canada and the United States, use CSA or UL-listed power cables.

The connector must comply with the NEMA 5-15 specification.

120 V power supply

A flexible cable with UL approval and CSA marking and the following features must be used: SJT design with three conductors, at least 18 AWG cross-section, a maximum length of 4.5 meters and parallel grounding-type plug (15 A, at least 125 V).

240 V power supply

A flexible cable with UL approval and CSA marking and the following features must be used: SJT design with three conductors, at least 18 AWG cross-section, a maximum length of 4.5 meters and Tandem grounding-type plug (15 A, at least 250 V).

230 V supply voltage outside the USA and Canada

A flexible cable with the following features must be used: conductor cross section at least 18 to AWG and grounding-type plug 15 A / 250 V. Make sure that the cable set complies with the safety standards of the country where the devices will be installed and that they bear the relevant markings.

Repairs

Repairs to the Panel PC may only be carried out by authorized, adequately trained personnel.

Warning

Unauthorized opening and repairs to devices can lead to severe property damage or represent a danger to the user.

Always unplug the power plug before opening the unit.

Only install system extensions which are intended for the computer. The installation of other expansions can damage the system or violate safety and radio interference regulations. Information concerning which extensions are suitable for the system can be obtained from technical service representatives or the sales outlet.

The terms of the warranty are deemed void in the case of defects caused to the Panel PC by the installation or replacement of system extensions.

The power supply may only be removed or replaced by authorized, adequately trained personnel.

Batteries

This unit contains batteries on the motherboard. The batteries may only be replaced by authorized, adequately trained personnel.

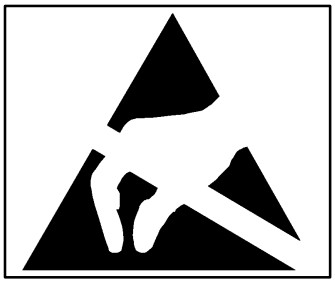
When disposing of the batteries, observe the locally applicable laws on disposal of pollutants.

Caution

Improper replacement of the battery poses danger of explosion. Only replace with batteries of the same type or those of a similar type recommended by the manufacturer. When disposing of the batteries, observe the locally applicable laws on disposal of pollutants.

ESD guidelines

Components containing ESD (Electrostatically Sensitive Devices) may be identified by the following label:



When handling components containing ESD, it is essential to observe the following guidelines:

- Before working with components containing ESD, you must discharge any static electricity from your body (e.g. by touching a grounded object).
- Any devices and tools used must also be free of static electricity.
- Pull the power plug before connecting or disconnecting components containing ESD.
- Only touch the components containing ESD at the edges.
- Do not touch any contact pins or strip conductors on components containing ESD.

1.3 Certificates, Guidelines and Declarations

CE identification

CE The SIMATIC product described in this manual fulfills the requirements to be awarded the CE identification.

EMC guidelines

Units with **Power Supply 105W Power** fulfill the requirements of EU Guideline “89/336/EEC Electromagnetic Compatibility” and are designed for use in the following sectors according to the CE identification:

Area of use	Requirements on	
	Emitted interference	**Noise immunity**
Industrial sector	EN 50081-2: 1993	EN 50082-2: 1995

Units with an AC power supply comply with the standards EN 61000-3-2:1995 (harmonic currents) and EN 61000-3-3:1995 (voltage fluctuations and flicker).

Caution

This is Class A equipment. The equipment may cause radio interference in residential areas; in such cases, the operator can be requested to take reasonable countermeasures.

Low voltage guidelines

The devices with AC power supply meet the requirements of EU Guideline 73/23/EEC ”Low voltage guideline”. Maintenance of this standard was tested according to EN60950.

Declaration of Conformity

The EU Declaration of Conformity and associated documentation complying with the above guideline are kept available for the authorities responsible by :

Siemens AG
Bereich Automation & Drives
A&D AS RD 4
Postfach 1963
D-92209 Amberg
Tel.: +49 (9621) 80-3283
Fax: +49 (9621) 80-3278

Observe installation guidelines

The installation guidelines and safety notes specified in this manual must be observed when starting up and operating the system.

Connection of periphery devices

The requirements concerning interference immunity are met when periphery equipment suitable for industrial demands, is connected in accordance with EN50082-2:1995. Periphery devices should only be connected using shielded cables.

DIN ISO 9001 certificate

The quality assurance system of our entire product production process (development, production and sales) meets the requirements of DIN ISO 9001 (corresponds to EN29001: 1987).

This was confirmed by the DQS – Deutsche Gesellschaft zur Zertifizierung von Qualitätsmanagementsystemen mbH) – (German quality management system approval authority).

EQ Net Certificate No.: 1323-01

1.4 Certification for USA, Canada and Australia

Safety

If the device bears one of the following marks, the corresponding approval has been awarded:

	Underwriters Laboratories (UL) complying with Standard UL 1950 (I.T.E) or complying with UL508 (IND.CONT.EQ)
	Underwriters Laboratories (UL) complying with Canadian Standard C22.2 No. 950 (I.T.E) or complying with C22.2 No. 142 (IND.CONT.EQ)
	Underwriters Laboratories (UL) complying with Standard UL 1950, Report E11 5352 and Canadian Standard C22.2 No. 950 (I.T.E) or complying with UL508 and C22.2 No. 142 (IND.CONT.EQ)
	UL Recognition Mark
	Canadian Standard Association (CSA) complying with Standard C22.2. No. 950 (LR 81690) or complying with C22.2 No. 142 (LR 63533)
	Canadian Standard Association (CSA) complying with American Standard UL 1950 (LR 81690) or complying with UL 508 (LR 63533)

EMC

USA

Federal Communications Commission
Radio Frequency Interference Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Shielded Cables

Shielded cables must be used with this equipment to maintain compliance with FCC regulations.

Modifications

Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

Conditions of Operations

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Canada

(for devices with **power supply 105W**)

Canadian Notice

This Class A digital apparatus complies with Canadian ICES-003.

Avis Canadien

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

(for devices with **power supply 85W**)

Canadian Notice

This Class B digital apparatus complies with Canadian ICES-003.

Avis Canadien

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

Australia

This product meets the requirements of the AS/NZS 3548 Norm.

Starting Up the Computing Unit

2

Chapter Overview

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2.1 Unpacking and Checking the Computing Unit

Unpacking the computing unit

Unpack the item delivered to you as follows:

1. Remove the packaging.
2. Do not throw the original packaging away. Keep it in case you have to transport your PC at some time in the future.
3. Please keep the enclosed documentation in a safe place. You will require it when you first start up the item delivered to you and it is part of the device.
4. Check the packaging and the package contents for any visible damage.

Entering the production number (SVP number)

5. Record the serial number (SDVP number) of your computing unit in the table; you will find it on the rating plate above the floppy disk drive on the side of the device.

   The SVP number and MLFB number provide unique identification of the device or repairs or in the case of theft.

Entering the Microsoft Windows “Product Key” of the “Certificate of Authenticity”

6. Enter the Microsoft Windows ”Product Key” of the ”Certificate of Authenticity” (COA) in the table. The Product Key can be found on the unit on the power supply cover. The Windows Product Key is necessary should the operating system need to be reinstalled.

SVP No.	
MLFB No.	
Microsoft Windows Product Key	

2.2 Installing the Computing Unit

The unit delivered is particularly suited for installation in consoles, cabinets and panels.

The computing units **with AC power supply** meet the requirements of the fire protection housing complying with EN60950. It can therefore be installed without an additional fire enclosure;

The computing units **with a DC power supply** are considered open operating resources (right side of device); therefore, the assembly design must fulfill the fire protection housing requirements.

Please observe the following points when installing your device:

- Avoid extreme ambient conditions as far as possible. Protect the device from dust, moisture and heat.
- Do not expose your device to direct sunlight.
- The device must be installed in such a way that it presents no danger of any kind (for example, by tipping over).
- The clearance around the device must be at least 100 mm to make sure it is sufficiently ventilated.
- Never cover the ventilation slots.
- Observe the installation locations allowed when you install your device.

Warning

If systems are installed at a non-approved installation location, the approvals to UL 1950 and EN60950 are no longer valid!

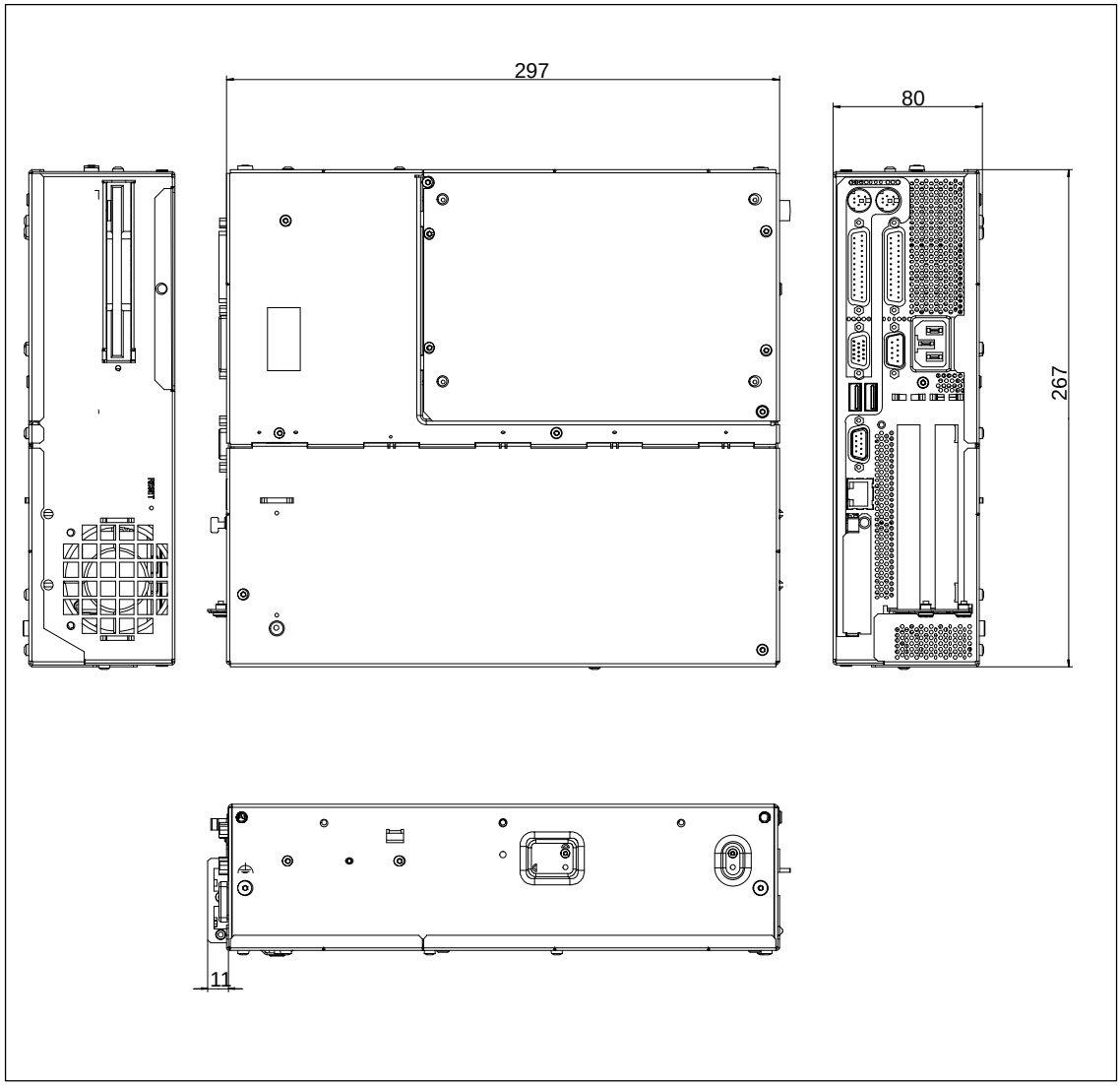


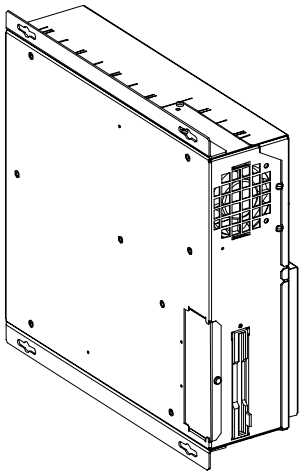
Figure 2-1 Dimension drawings for installation of the computing unit (device without CD-ROM drive)

The computing unit contains a CD-ROM or CD-RW/DVD drive, depending on the unit version. The installation depth of the computing unit is increased by 21 mm as a result of its installation.

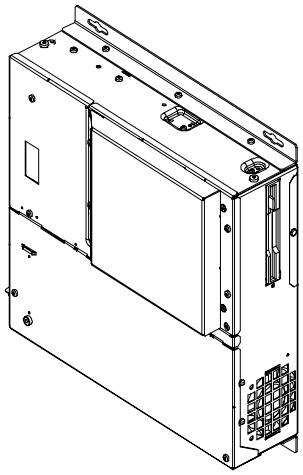
Permissible installation positions for the computing unit complying with UL1950/EN60950/CSA22. 2 No. 950

An angle of inclination of ± 20° is allowed installation position.

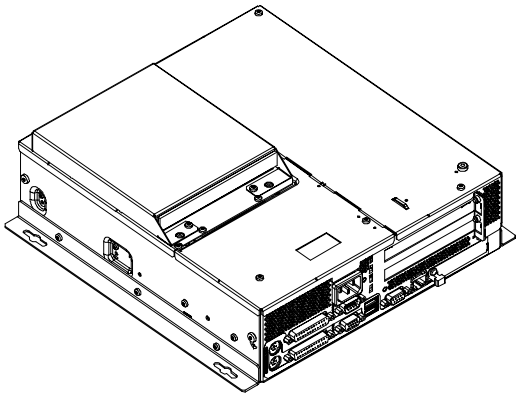
Position 1 (preferred position)



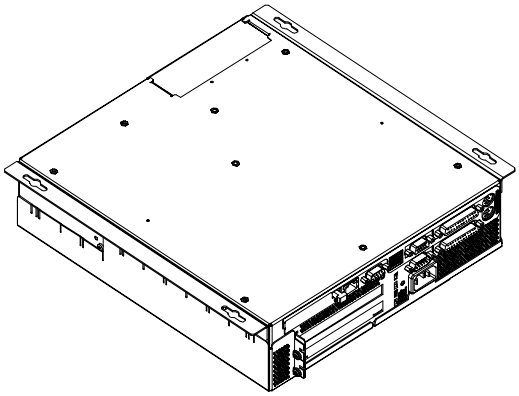
Position 2 *)



Position 3 (desktop)



Position 4 (cover) **)



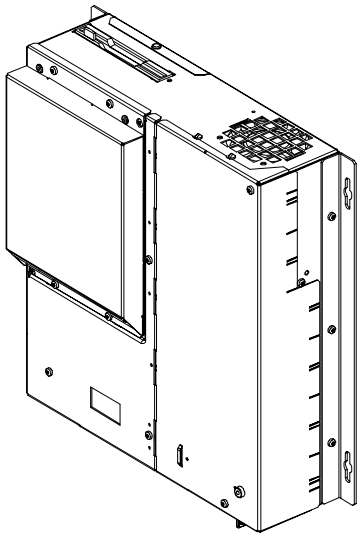
*) Not permitted where an LS240 drive is installed.

**) Not permitted where a disk/CD-ROM/LS240 drive is installed.

Additional permissible installation position for the computing unit complying with UL508/CSA 22.2 No. 142

An installation angle of ±15° is permitted in this position.

Position 5
(interfaces at bottom)



Note

The possible installation locations for the computing unit do not agree with the permissible installation location of Panel PC 670 (refer to the commissioning instructions).

2.3 Ensuring Readiness for Service

Measures for equipotential

Low-resistance grounding connections ensure that the user of the installation is protected against electric shock (for example, if a short-circuit occurs or if there are defects in the system). Moreover, they discharge interference transmitted by external power supply cables, signal cables or cables to I/O devices.

You should therefore create a low-resistance connection (a large surface acting as the contact) between the grounding point on the system housing and the central grounding point of the cabinet or the installation in which the computer is to be installed. The minimum cross-section should not be less than 5 mm^2.

The grounding terminal is located on the side of the device and is identified by a ⏚ symbol.

Connection to the power supply

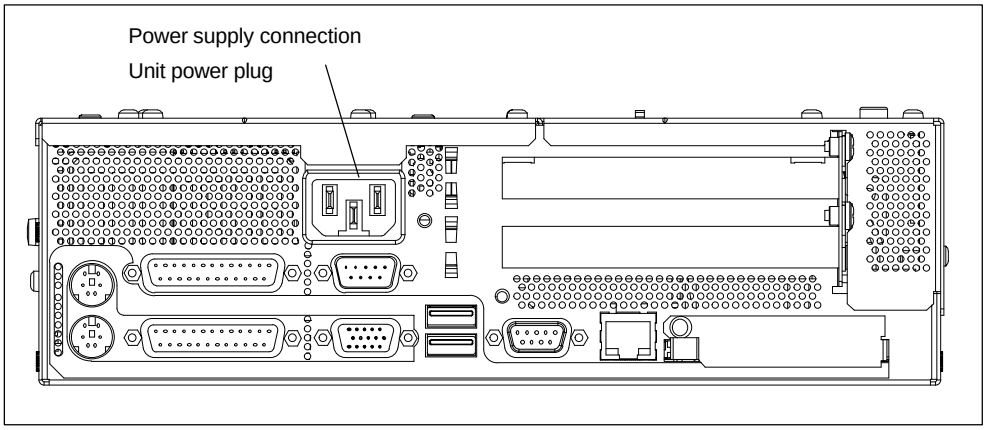


Figure 2-2 Power supply connection (device socket for non-heating appliances)

Caution

The computing unit is equipped with a safety-tested power supply cable and may be connected only to a socket outlet with grounding contact.

Make sure that the socket outlet on the device or the socket outlet with grounding contact of the building wiring system is freely accessible and located as near to the device as possible.

The computing unit does not have a mains switch. To completely disconnect the PC from the mains power supply, you must pull the plug. This connection must be easily accessible.

If the PC is to be installed in a cabinet, a central disconnector must be provided.

The **AC** power supply of the computing unit is designed for 120/230/240 V mains supplies.

The power supply has a wide range input. There is no need to adjust the voltage range.

The **DC** power supply of the computing unit is designed for 24 V mains supplies.

One of these power supply is installed according to selection.

Connecting and switching on the computing unit

Before connecting computing unit to the mains, connect the front panels ready for operation.

1. Plug the connection cables into the corresponding sockets on the interface side of the computing unit (refer to “Panel PC 670/870 Computing Unit“ equipment manual).
2. Once the peripheral devices have been connected, the device is ready for mains operation. Connect your device to the mains supply. The computing unit is now operating.

Switching the computing unit off

Before switching the unit off, shut down the operating system in order to prevent loss of data. The computing unit has no power switch and is disconnected from the mains supply by unplugging the power plug.

Notice

When working using Windows, always use **Start > Shut Down** in the taskbar to switch the unit off.

2.4 Transport

Shipping

Despite the robust design of the computing unit, its built-in components are sensitive to severe vibrations and shock. Therefore, protect the computing unit from severe mechanical stress during transport.

Only the original packing should be used when dispatching the Panel PC.

Caution

Risk of damage to the computing unit.

When in transit in cold weather and the computer is subjected to extreme differences in temperature, care must be taken to ensure that moisture is not deposited on or in the device (moisture condensation).

Allow the computer to warm up slowly to room temperature before putting it into operation. If condensation has formed, wait for approximately. 12 hours before turning the computer on.

Connecting and Switching on the Computing Unit

3

Chapter Overview

In Section	You Will Find	on Page
3.1	View of Interface Side	3-2
3.2	View of Drive Side	3-5
3.3	Connecting Peripheral Devices	3-6
3.4	Working with PC Cards	3-10
3.5	Drives	3-13
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3.7	Using the Computing Unit in a SIMATIC S5 Network	3-18
3.8	Using the Computing Unit in a SIMATIC S7 Network (MPI/DP)	3-22
3.9	Networking the Computing Unit and Other Nodes via PROFIBUS	3-24
3.10	Networking the Computing Unit and Other Computers via Industrial Ethernet	3-25
3.11	Connection under Windows	3-25

3.1 View of Interface Side

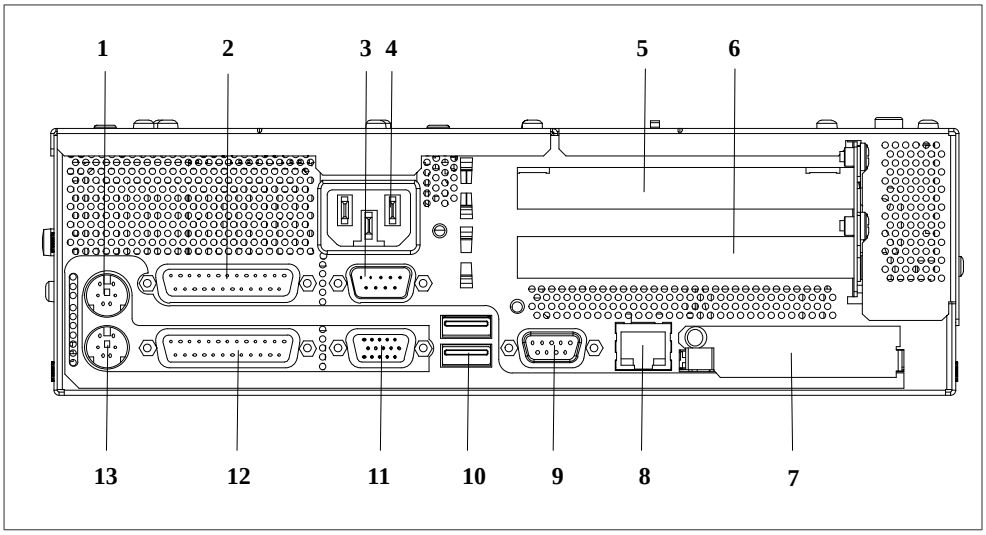

Figure 3-1 Ports

1 Mouse

PS/2 socket for connecting a PS/2 mouse.

2 COM1 V.24 /MODEM /PLC

The COM 1(TTY) interface can be used to connect e.g. S5 programmable controller (PLC). By implementing the adapter supplied, the interface can also be used as a 25-pin V.24 standard interface to connect devices with a serial interface, such as modem, mouse or printer.

3 COM 2

Serial interface 2 (V.24) to connect devices with a serial interface, such as modem, mouse or printer.

4 AC/DC power supply connection

Device socket for AC voltage power supply or screw terminals for DC voltage power supply.

5 PCI slot

Internal slot for expansion modules.

6 PCI/ISA slot

Internal slot for expansion modules.

7 PC card

Connection for PC cards of the type I/II/III.

8 Ethernet

RJ 45 Ethernet connection. The Ethernet network is a local network with a bus structure for data communication with data transmission rates of 10 or 100 megabits per second (mbps).

9 PROFIBUS/MPI

Using the potential isolated PROFIBUS/MPI interface, the Box PC an can be connected to an S7 PLC or a PROFIBUS network.

10 USB

Connections for Universal Serial Bus. Using the USB connection, it is possible to connect external devices, such as CD drives, printers, modems or mouse and keyboard. Older operating systems do not support this interface.

11 VGA

A VGA monitor can be connected here.

12 LPT1

The parallel interface serves to connect devices with a parallel interface, e.g. a printer.

13 Keyboard

Connection for a PS/2 keyboard.

Caution

When connecting periphery units, always be sure to use shielded cables and metal connectors to avoid invalidating your operating authorization. Use a screwdriver to fasten the interface cable connectors on the housing of the computing unit. You will thus improve the electrical shielding.

If expansion boards are installed on the computing unit, there are additional interfaces. Please refer to the description of the relevant module for the significance of these additional interfaces.

VGA interface

Please observe the following note on operating a flat display and an external monitor:

Note

The default setting of the display is simultaneous operation of a flat display and an external monitor. If no front display element is connected, the external monitor is used for the display, at a resolution of 640 x 480 pixels. Modes with a lower resolution and text modes are expanded to this format.

To optimize the display on the external monitor, set ”CRT/LCD selection: CRT enabled” in Setup in the Main menu using the ”Hardware Options” dialog box. A resolution of 1024 x 768 pixels with a higher image refresh rate is then possible.

3.2 View of Drive Side

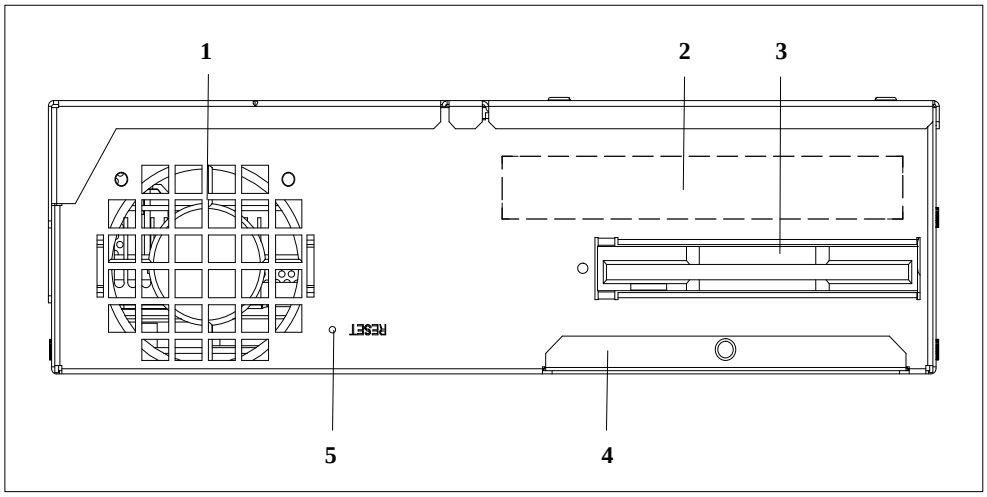

Figure 3-2 Drive side

1 Unit fan

The air vents for the unit fan are located here.

Caution

The air vents must never be covered up, otherwise there is a risk of overheating.

---

2 Rating plate

The rating plate contains the order no. and production serial no. (F-No.) of the unit.

3 Floppy disk drive

A standard floppy disk drive (1.44 MB) is installed in the computing unit.

4 Front interfaces

The front interfaces are located behind the cover plate below the floppy disk drive. They serve for the connection of operating fronts:

- I/O port for connecting front components
- LVDS display port

5 Reset button

The reset button can be operated with the aid of a pointed object (e.g. a straightened paper clip). Pressing the Reset key triggers a hardware reset. The PC is restarted (cold start).

Caution

There may be a loss of data with a hardware reset.

3.3 Connecting Periphery Units

Note

Make sure the components you insert exhibit industrial compatibility when connecting peripheral devices

Printer connection via the parallel interface

To connect your printer, perform the following steps:

1. Turn off the computing unit and the printer.
2. Plug the printer cable onto the parallel port, LPT 1.
3. Connect the printer cable to the printer.
4. Tighten (screw) the connector on the port.

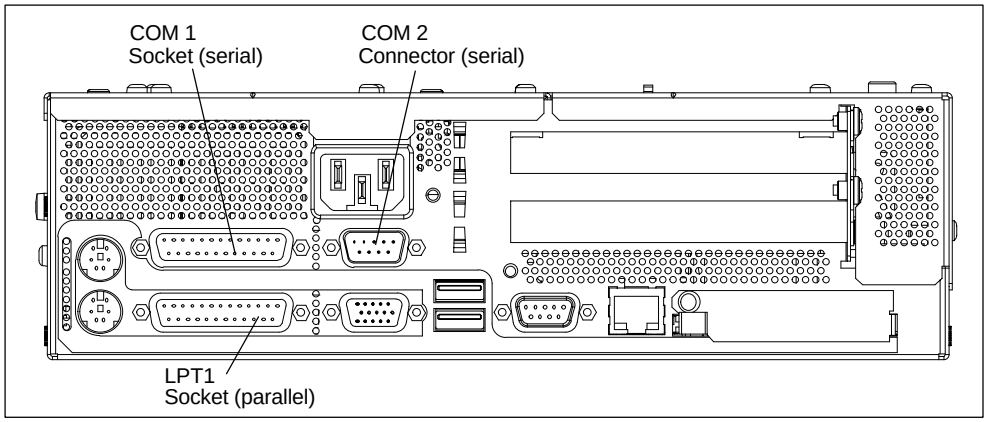

Figure 3-3 Printer Connection

Caution

Danger of damage being caused to the device

Connect printers to the parallel port only when the device on the LPT 1 port is turned off (printer likewise turned off).

Make sure you are using the correct port. If you interchange the connectors, or use wrong connecting cables, the port might be damaged.

Before inserting the connecting cables, the static charge of your body, the device and the connecting cables must be brought to the same level. You can do this by briefly touching the metal housing.

Use the original cable to establish the connection.

Printer connection via the parallel serial interface

Alternatively, you can connect your printer via a serial COM interface to the computing unit. You will find information on how to adapt and set your port and on the connecting cable you should use in the user manual for your printer.

Using a mouse

A PS/2, USB or a serial mouse can be used in conjunction with the computing unit.

PS/2 mouse connection

You can connect an external PS/2 mouse or another external input device (pointing device) to the PS/2 mouse port.

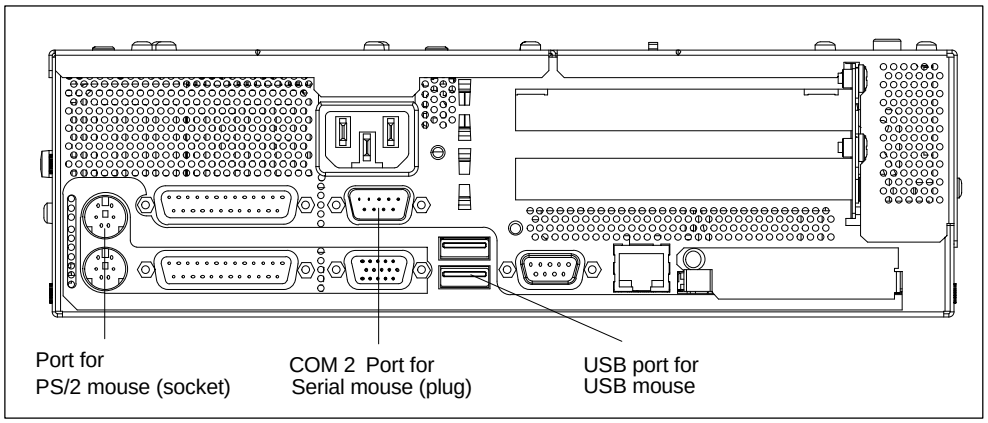

Figure 3-4 Connecting the Mouse

Proceed as follows:

1. Disconnect the unit from the mains power supply.
2. Insert the cable of the PS/2 mouse or of another external input device (pointing device) into the PS/2 mouse socket.
3. Restart the unit.

Serial mouse connection

You can connect a serial mouse to the serial port COM 2. To operate a serial mouse, you have to install and assign parameters to the suitable mouse driver. To do this, please refer to the description of your mouse or the description of your operating system for the necessary information.

1. Turn your device off.
2. Plug your serial mouse onto the mouse connector labeled COM 2.
3. Screw the connector tight.
4. Restart your device.

How to connect a USB mouse is described in “Connecting USB devices” below.

PS/2 Keyboard connection

You can connect a PS/2 keyboard to the computing unit.

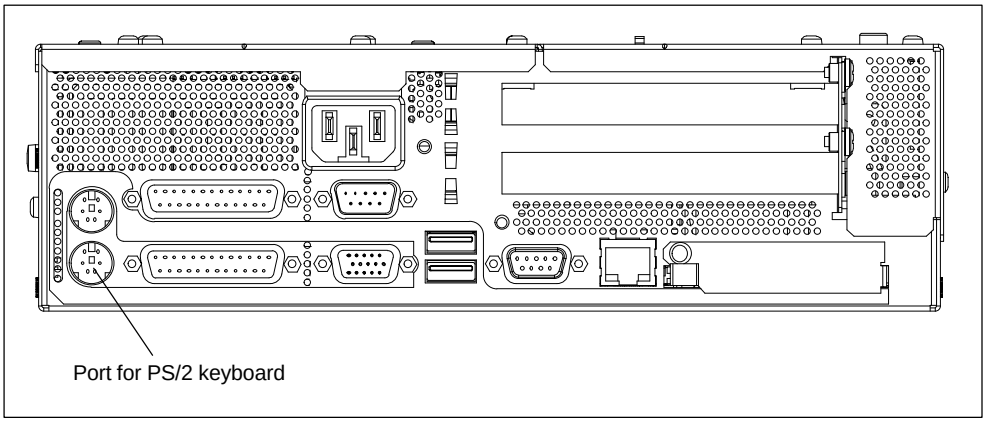

Figure 3-5 Connecting a PS/2 Keyboard

Proceed as follows:

1. Disconnect the computing unit from the mains power supply.
2. Plug in the PS/2 keyboard connector.
3. Connect the computing unit to the mains power supply.

Note

We recommend you to use a keyboard with a straight keyboard connector so that the connector does not conceal adjacent ports.

USB device connection

Individual or several USB devices can be connected to the USB interfaces.

- Plug in the USB device connector into one of the USB interfaces.

The device is detected by the Plug and Play operating system. Any necessary drivers are requested by the operating system.

If more than two USB devices are to be connected, use a HUB. Both interfaces can be used as High Current interfaces.

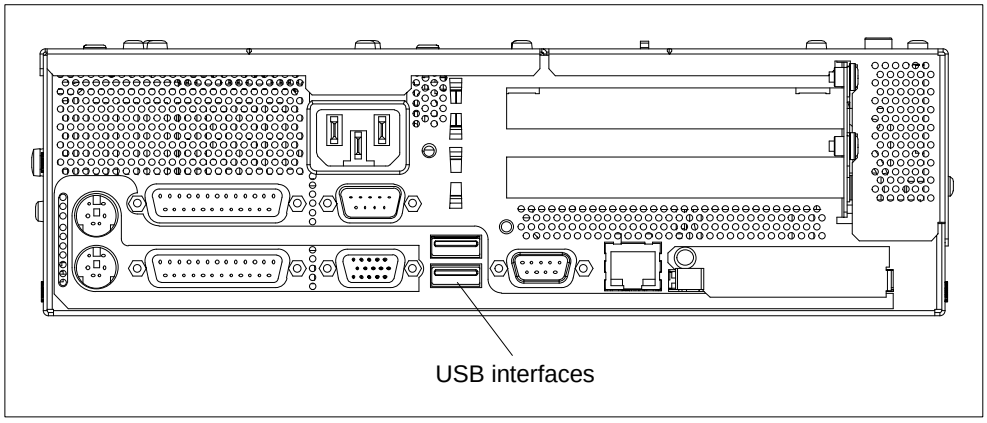

Figure 3-6 USB connection ports

Notice

Operating systems which do not support “plug and play” (e.g. Windows NT 4.0) do not generally permit operation of USB devices.

Devices which do not have a USB plug (e.g. printer) can be connected to the USB interface via an adapter.

3.4 Working with PC Cards

PC cards

Card bus cards (32 bit) and PCMCIA cards (16 bit) can be operated in the PC card interface. The computing unit is equipped with a PC card interface. Communication modules for MODEM, FAX/MODEM, ISDN, Token Ring, ETHERNET, memory expansions and check-card sized SCSI modules can be plugged into this interface.

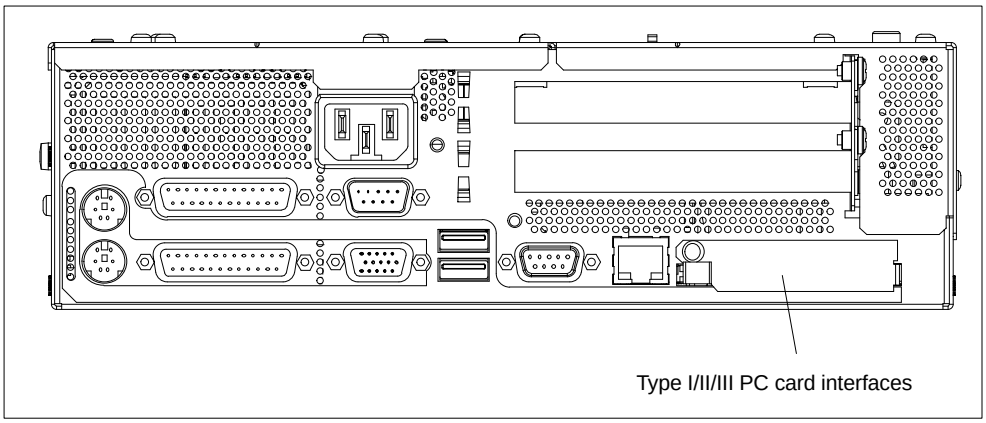

Figure 3-7 PC card interface

Take note of the following when working with Cardbus/PC cards:

1. Open the port cover on the left side of the device by loosening the plastic rivet with a flat screwdriver.
2. Remove the metal cover from the guide rail.
3. Insert the PCMCIA card or Cardbus card you require.

Caution

Make sure that the eject button for Cardbus/PC cards is fully depressed before inserting the PC card. If this is not the case, a card may jam in the slot when inserting thin PC cards (flash memory cards, for example). The PC card can then not be inserted properly.

The nameplate of the PC card must be visible to the rear of the device on being inserted.

Do not remove the cared until data transfer has stopped (danger of loss of data and system crash).

Caution

Always discharge your body's static charge before inserting or removing Cardbus/PC cards by briefly touching a grounded object (refer also the ESD Guideline, Appendix B).

Damage could occur if you do not.

Note

Peak currents of 650 mA at 5 V referred to 3 s are allowed.

Examples of PCMCIA cards on the PC card interface for

hard disk drive	330 mA *read/write*
(Maxtor MXL-131-III)	640 mA *spin up 2 s*
.....	110 mA *idle*
fax/modem	60 mA *idle*
(Dr. Neuhaus)	140 mA *transfer*
Ethernet	
(XIRCOM)	150 mA

Installation von PC cards

Observe the following points when you install these cards:

Note

Depending on the configuration of the computing unit, it could be that there are no free interrupts for the operation of PC cards. The interrupts required by the PC card must then be reserved as follows in the BIOS Setup menu:

Define the required interrupt by setting **Advanced > PCI-Configuration > PCI/PNP ISA IRQ Resource Exclusion** to *reserved* (default: *available*).

Caution

Danger of PC cards and the computing unit being damaged.

The PC card must be plugged into the interface with its front facing the rear side of the computing unit. This side is normally marked with a company or product name and the wording ”This side up” or something similar.

If the PC card is inserted incorrectly, the computing unit and PC card may be damaged.

Before inserting the connecting cables, the static charge of your body, the device and the connecting cables must be brought to the same potential. To do this, touch the metal housing briefly.

Notice

In order to operate the PC card set **Main > Hardware Option** “Cardbus/PCMCIA Slot” in the BIOS Setupmenu to “Enabled”.

3.5 Drives

The computing unit is equipped with a 3.5” floppy disk drive or LS 240 drive and a 3.5” hard disk drive as standard equipment.

3.5.1 Floppy disk drive

The floppy disk drive can be used to store programs and data on disks and load them from disk into the computing unit.

Disk types

The following disks can be used:

double sided double density diskettes	double sided high density diskettes	LS240 superdisks
3.5 inch	3.5 inch	3.5 inch
720 Kbyte	1.44 Mbyte (135 TPI)	120 MB

Caution

Caution: This could result in loss of data!

The eject button must never be pressed while the green LED drive lamp is on.

3.5.2 LS240 drive

As an alternative to a floppy disk drive, the computing unit can be equipped with an LS240 drive for customized solutions.

The LS240 can save larger amounts of data on data media than a 1.44 MB floppy disk drive. The LS240 drive has the following characteristics:

- is compatible with 1.44 MB floppy disk and LS120 drives, i.e. 1.44 MB and 120 Mbyte disks can be used,·
- the maximum data capacity is 240 Mbyte using a LS240 data medium,
- the LS240 drive is connected via an ATAPI(IDE) interface.

Handling LS240 drive disks

The disks are inserted in the disk drive as illustrated below according to the installation position:

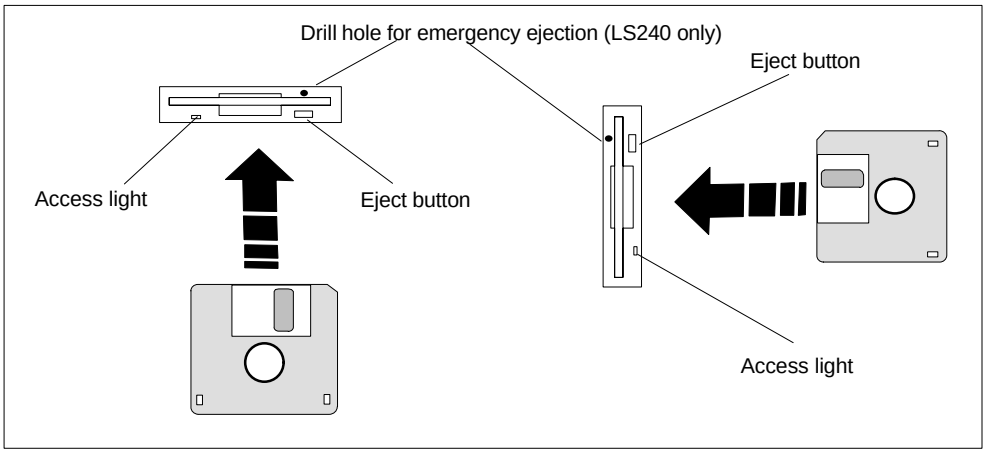

Figure 3-8 Handling Floppy Disks

Caution

Caution: This could result in loss of data!

The eject button must never be pressed while the LS240's green LED drive lamp is on.

LS240 drives are very sensitive when it comes to unacceptable vibrations. During operation, vibrations might damage the drive and/or the data medium. Refer to the technical data in the Appendix A.1 for the permissible values.

Notes on using the LS240 superdisks

The LS240 drive supports the use of standard 3.5” disks with 1.44 Mbyte capacity as well as superdisks with a capacity up to 240 Mbyte.

The track density of superdisks is 10 μm as compared to 120 μm with standard disks.

The LS240 drive detects the presence of a superdisk and switches to the higher capacity.

Due to their higher capacity, superdisks are more sensitive to dirt, temperature fluctuations and shocks than standard disks.

Notice

Observe the following to ensure reliable operation and high degrees of data integrity:

- Keep and transport superdisks in the protective cassette provided. This protects the data medium from dust and dirt.
- Only remove the superdisk from the drive when no reading or writing operations are in progress. The data medium is protected from particles of dirt. Do not expose the data medium to unnecessarily high operating temperatures.

Notice

When operations are in progress using the superdisk, avoid vibrating the unit. Superdisks are more sensitive to vibrations due to the higher track density.

Emergency eject:
When the unit is switched off, the disk can be ejected by inserting a pinted object (e.g. straightened paper clip) in the relevant opening provided.

3.5.3 Hard disk drive

The hard disk is used to store large quantities of data. It is installed on a vibration-damped mounting that is easy to replace.

Caution

Danger of data being lost and the drive damaged

Drives are very sensitive to unacceptable vibrations. During operation, vibrations can result in a loss of data or damage to the drive or a data medium.

If you wish to ship the device, wait until the drive has come to rest after you turn off the device. (Approximately 20 s.)

3.5.4 CD-ROM drive or CD RW/DVD drive (depending on unit equipment)

The computing unit contains a CD-ROM or CD-RW/DVD drive, depending on the unit version. The installation depth of the computing unit is increased by 21 mm as a result of its installation.

Operation

After pressing the Open/Close button, the CD/DVD tray is extended following a short delay. Insert the CD/DVD in the tray with the inscription side up. The CD/DVD tray is automatically retracted after either pushing the tray lightly or pressing the Open/Close button.

Press the Eject button to extend the CD tray. The CD/DVD can then be removed.

Emergency eject

When the unit is switched off, the CD/DVD can be ejected by inserting a pinted object (e.g. straightened paper clip) in the relevant opening provided.

Notice

After the tray has been closed, the CD is tested and the access LED on the drive starts to flash:

– If the LED flashes continually, the CD/DVD is faulty but can still be read.
– If the LED flashes several times and then remains on, the CD/DVD inserted is defective and cannot be read.
– The access light is normally on when reading information from the CD/DVD.

Caution

CD-ROM drives are sensitive to unacceptable vibrations. During operation, vibrations might damage the drive and/or the data medium.

Additional software

In order to use the full functional scope of the DVD-ROM/CD-RW drive, additional siftware is required (DVD player or printer software). It is part of the material supplied, being available on the CD. To install the software, insert the CD in the drive and follow the instructions which appear on the screen.

3.6 Backup Battery

A backup battery (3.6 V lithium battery) powers the real-time clock even after the unit has been turned off.

This unit contains a battery on the motherboard. The batteries may only be replaced by authorized, adequately trained personnel. Observe the information in the documentation on the CPU module. When disposing of the batteries, observe the locally applicable laws on disposal of pollutants.

Caution

Improper replacement of the battery poses a danger of explosion. Only replace with batteries of the same type or those of a similar type recommended by the manufacturer. Dispose of used batteries according to the applicable laws or manufactuer's information.

Warning

Danger of personal injury and damage to property, danger of release of noxious matter.

A lithium battery can explode if mistreated and noxious matter might be released if old batteries are disposed of wrongly.

Do not throw new or empty lithium batteries into the fire, and do not solder on the cell housing; do not recharge lithium batteries or force them open.

Obtain lithium batteries only from Siemens (Order No: W79084-E1003-B1).

If possible, return old lithium batteries to the manufacturer or recycling facility or dispose of them as special waste.

3.7 Using the Computing Unit in a SIMATIC S5 Network

Point-to-point connection

This section describes the options for connecting your computing unit to a programming unit or an S5 programmable controller in a point-to-point connection.

A point-to-point connection is possible by connecting the computing unit to another programming unit or a PLC via:

- a V.24 connection
- a TTY connection

Configuring notes for interfaces with current loop (TTY, 20 mA)

Different criteria have to be taken into account for reliable operation of a connection. The maximum data transfer rate (baud rate) depends on the required distance, the type of cable, the pin assignment of the interface and external interference.

Rules

To reduce interference by a favorable choice and correct connection of the cable, you should comply with the following rules:

- The shielded cable used must have a low line resistance (< 130 Ω / km) and a low capacitance (< 90 pF/ m). Twisted-pair cables are less susceptible to inductive interference. A low line resistance result in reduced voltage excursions and shorter charge reversal times; the line resistance decreases with increasing conductor cross-section for the same length of cable.
- The shorter the data transmission link, the higher the maximum possible transfer rate.
- If there is an active transmitter and an active receiver at the same end of the transmission link, the sequence of access priority to the transmission circuit must be taken into account in order to achieve the longest possible transmission link.
- Signal lines and power lines must not be run together. Signal lines must be installed as far away as possible from sources of strong interference (for example, 400 V 3-phase power cables).
- The active TTY interface with a 12 V open-circuit voltage has been tested on a 100 m long cable at a transmission rate of 9600 bps in an environment with normal levels of noise (field strength < 3 V/ m). If a LiYCY 5 x 1x 0.14 shielded cable is used, reliable transmission is possible over a distance of up to 100 m. The AS511 driver was used for testing (only one transmitter at a time).

Note

The interference field of the source of interference is reduced by the square of the distance.

Connecting the computing unit to an S5 PLC

You can connect the computing unit to a SIMATIC S5 programmable controller using the COM 1/TTY interface.

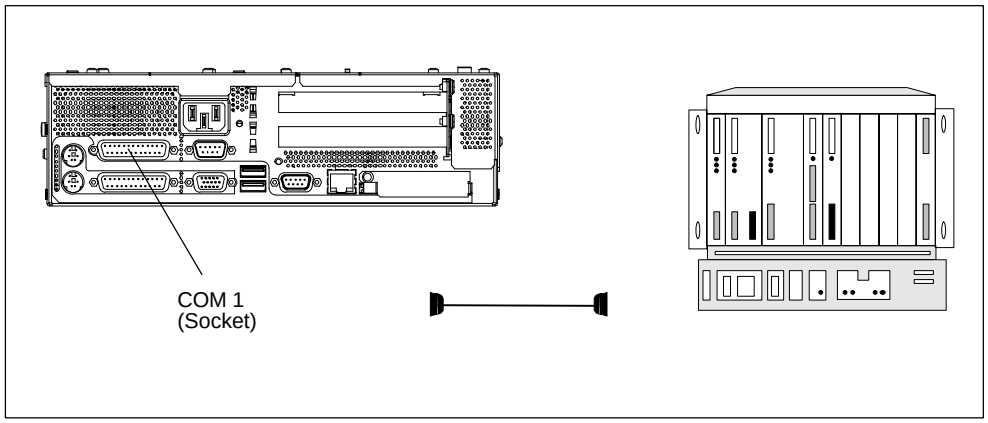

Figure 3-9 Connection to an S5 Programmable Controller

To connect the computing unit to a SIMATIC S5 programmable controller, perform the following steps:

1. Disconnect the computing unit from the mains power supply.
2. Plug the connecting cable onto the COM 1 port.
3. Screw the connector tight.
4. Plug the connecting cable into the corresponding port on the CPU of the programmable controller.
5. In order to enable TTY operation, you must set TTY to “enabled” in the BIOS setup. Access the BIOS Setup by pressing the F2 key during the boot routine.

Caution

Danger of damage being caused to the device

If you interchange the connectors, or use wrong connecting cables, the port might be damaged.

Be careful not to plug the TTY cable in the LPT 1 port of the computing unit instead of the COM1/TTY port.

Before inserting the connecting cables, the static charge of your body, the device and the connecting cables must be brought to the same potential. To do this, touch the metal housing briefly.

Use only the original connecting cable for the connection to the programmable controller.

Connecting the computing unit via an adapter

An adapter is available for connecting the computing unit to the PLC with earlier standard connecting cables.

Table 3-1 Adapters for connecting the computing unit

Interface	Connection	Connecting cable Order No.	Adapter
COM 1 as TTY port	Computing unit to a SIMATIC S5 programmable controller	6ES5 734-2BF00	
		6ES5 731-1xxx0 15-pin	6ES5 731-6AG00
		6ES5 731-0xxx0 25-pin	6ES5 731-6AG00

In order to maintain a data transmission rate of 9600 bps up to a distance of 1000 m, the receive diode is connected to ground (reference) via the connecting cable.

Note

Lengths deviating from the standard connection cable (6ES5 734-2BF00) can be obtained using Order No. 6ES5 734-2xxx0, whereby xxx stands for the cable length length code.

Connecting the computing unit to programming units (TTY)

In order to connect the computing unit, connect the corresponding connection cable to the TTY interface.

Table 3-2 Connecting the computing unit to other programming units

Interface	Connection	Connecting cable Order No.	Adapter
COM 1 as TTY port	with PG 6xx	Series connection of 6ES5 733 -2xxx0[2)] and 6ES5 731-6AG00[1)]	6ES5 731-6AG00

Notice

1. When connected in series, it is essential to connect the cable in the right direction (refer to Figure 3-10).
2. The connecting cable is available for order only as a spare part. A description of the connecting cables is provided in Chapter 7.

Figure 3-10 Direction of Connection: Adapter - Connecting Cable

Notice

When connecting the computing unit to another programming unit, switch the TTY ports (COM 1) in one of the programming units by changing the jumper setting. When the computing unit is delivered to you, this port is always set to active.

3.8 Using the Computing Unit in a SIMATIC S7 Network (MPI/DP)

Connecting an S7 PLC via the MPI/DP interface

Using the potential isolated*) MPI/DP interface, the computing unit can be connected to a SIMATIC S7 PLC or a PROFIBUS network. Using the MPI connection cable (5 m) for connection to the SIMATIC S7 CPUs (Order No.: 6ES7901-0BF00-0AA0), only transmission rates of up to 187.5 Kbit/s are possible. For baud rates from 1.5 Mbit/s, the PROFIBUS 12 Mbit/s (Order No. 6ES7901-4BD00-0XA0) connection cable is necessary.

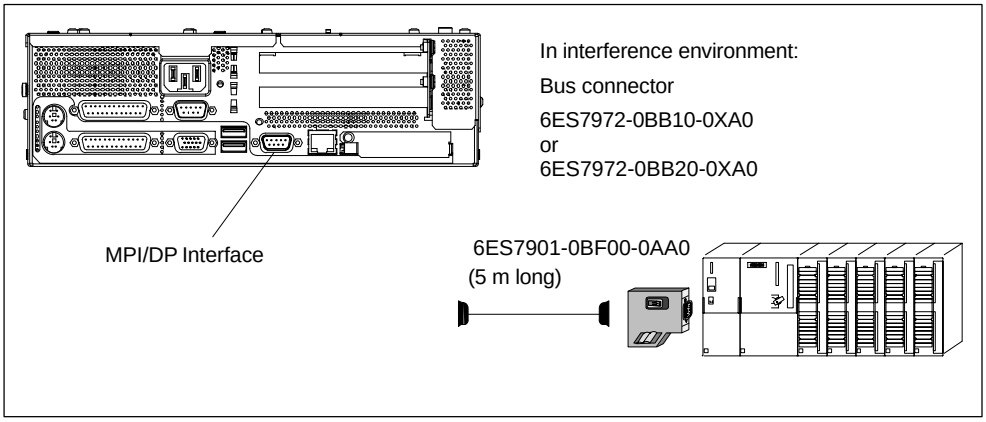

Figure 3-11 Connection Using the MPI/DP Interface

To connect the computing unit to a SIMATIC S7 programmable controller, perform the following steps:

1. Disconnect the computing unit from the mains power supply.
2. Plug the connecting cable onto the MPI/DP interface

Caution

Danger of damage being caused to the device

Before inserting the connecting cables, the static charge of your body, the device and the connecting cables must be brought to the same potential. To do this, touch the metal housing briefly.

*) Potential isolation within the SELV circuit.

Connection

Using the MPI/DP interface, it is possible to connect PCs with:

- MPI networks (S7 200, S7 300 and S7 400) or
- PROFIBUS-DP networks (DP components).

MPI/PROFIBUS-DP network

Up to 32 devices (PCs, programming units or PLCs) can be connected to the MPI/DP interface to form a network segment. The physical connection to the MPI/PROFIBUS-DP network is via an isolated RS485 interface, which is an integral part of the PC's basic board.

Several MPI/PROFIBUS-DP network segments can be connected via repeaters. The complete MPI/PROFIBUS-DP network can consist of up to 127 nodes. Data transmission rates of 9.6 Kbits to 12 Mbit/s are possible using the PROFIBUS-DP MPI network.

3.9 Networking the Computing Unit and Other Nodes via PROFIBUS

Networking the computing unit via PROFIBUS

PROFIBUS is an open and robust bus system for industrial use. It can be used to configure networks with up to 32 nodes per segment. PROFIBUS-DP supports data rates of 9.6 KBaud to 12 MBaud.

How the network functions

The network operates on the ”token passing with subordinate master/slave” principle (complying with DIN 19245, PROFIBUS). It distinguishes between active and passive nodes. An active node receives the token and passes it on to the next node within a specified time.

Hardware requirements

Using the following components, for example, you can connect or network the computing unit to/with PROFIBUS:

- interface RS 485, MPI/DP interface, integrated
- shielded, twisted pair cable (bus cable or spur line)

Note

Please refer to the SIMATIC NET Catalog IK IP for more information on the SIMATIC Net PC cards.

3.10 Networking Computing Unit and Other Computers via Industrial Ethernet

Networking the computing unit via Industrial Ethernet

The RJ45 Ethernet interface is a Twisted Pair (TP) interface with a data transmissin rate of 10/100 Mbaud. The onboard interface is compatible with the Intel pro/100+ PCI adapter.

The interface is Plug & Play capable and is automatically detected in Windows. The protocol settings are defined in the Windows Control Panel.

Notice

In order to operate the 100 Mbaud, an Class 5 Ethernet cable is required.

Note

Please refer to the SIMATIC NET Catalog IK IP for more information on the SIMATIC Net PC cards.

3.11 Connection Using Windows

Windows supports point-to-point connection via the LPT or COM. The connecting cables are standard, commercially available connecting cables. Refer to the section on networks in your Windows description or online Help “Connection to Another Computer”.

Maintaining and Extending the Computing Unit

4

Chapter overview

You can enhance the functionality of your computing unit by installing additional main memory. This chapter describes how to expand your computing unit. Please observe the safety notes it contains.

In Section	You Will Find	on Page
4.1	Opening the Device	4-2
4.2	Installing Additional Memory	4-8
4.3	Replacing the Backup Battery	4-10
4.4	Installing Expansion Boards	4-12
4.5	Removing and Installing Drives	4-17
4.6	Removing and Installing the Power Supply	4-22
4.7	Removing and Installing the Bus Board	4-23
4.8	Removing and Installing the Motherboard	4-24
4.9	Removing and Installing the Fan	4-25
4.10	Processor Upgrade	4-26
4.11	Reset Button	4-27

4.1 Opening the Unit

4.1.1 Conditions

The device is designed for easy maintenance so that any work that may be necessary can be done quickly and economically.

Caution

The electronic components on the printed circuit boards are extremely sensitive to electrostatic discharge. Certain precautionary measures are therefore necessary when handling such components. These measures are explained in the guidelines for electrostatic sensitive devices at the end of this manual (ESD Guidelines).

Restricted liability

All technical specifications and approvals apply only to expansion modules approved by Siemens AG.

No liability can be accepted for impairment of functions caused by the use of non-Siemens devices or non-Siemens components.

All the modules and components are electrostatically sensitive. Please observe the ESD notes. The following symbol indicates that electrostatically sensitive modules are present.

Before opening the device

Note the following rules before opening the device:

- Before you disconnect the power supply cable, discharge the electrostatic charge on your body. You can do this by briefly touching the mounting plate for the interfaces on the left side of the device.
- Discharge the electrostatic charge from tools you are using.
- Wear a grounding strap when handling components.
- Leave components and component parts in their packaging until you are ready to install them.
- Disconnect the device from its power supply before plugging in or removing any components or component parts.
- Touch components and module only on their edges. Do not touch contact pins or printed conductors.

Warning

Never operate the device with the cover open.

Tools

You can perform all necessary installation work on the computing unit with screwdrivers of the type TORX T10 and TORX T8.

4.1.2 Opening the computing unit

To open the computing unit, perform the following steps:

1. Turn off the computing unit, pull out the mains connector and remove all interconnecting cables and connecting cables from the device, including the keyboard cable.
2. Remove the computing unit from its mounting/cabinet (only necessary if mounting screws are inaccessible as a result of installation).
3. Undo the two screws (refer to Figure 4-1) on the housing cover.
4. Raise the cover slightly.
5. You can then remove the housing cover.

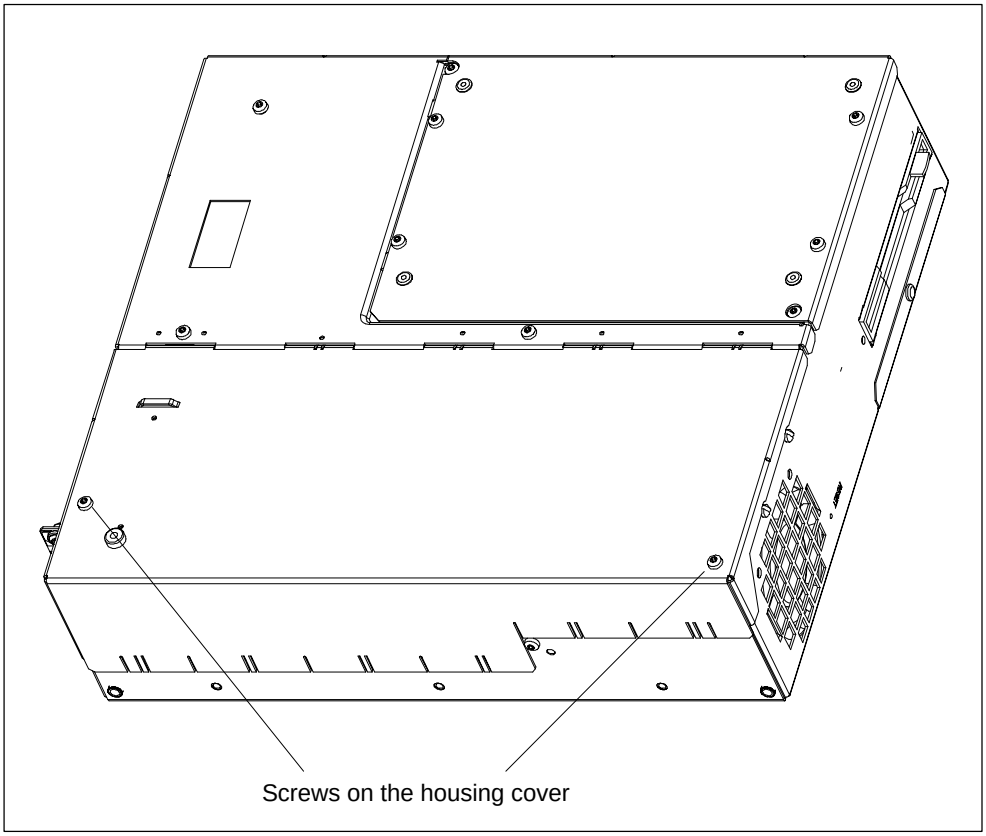

Figure 4-1 Computing unit prepared for opening

4.1.3 Functional Units Visible After Opening the Device

View

The function units become visible after removing the top cover of the unit and removing the hard disk module.

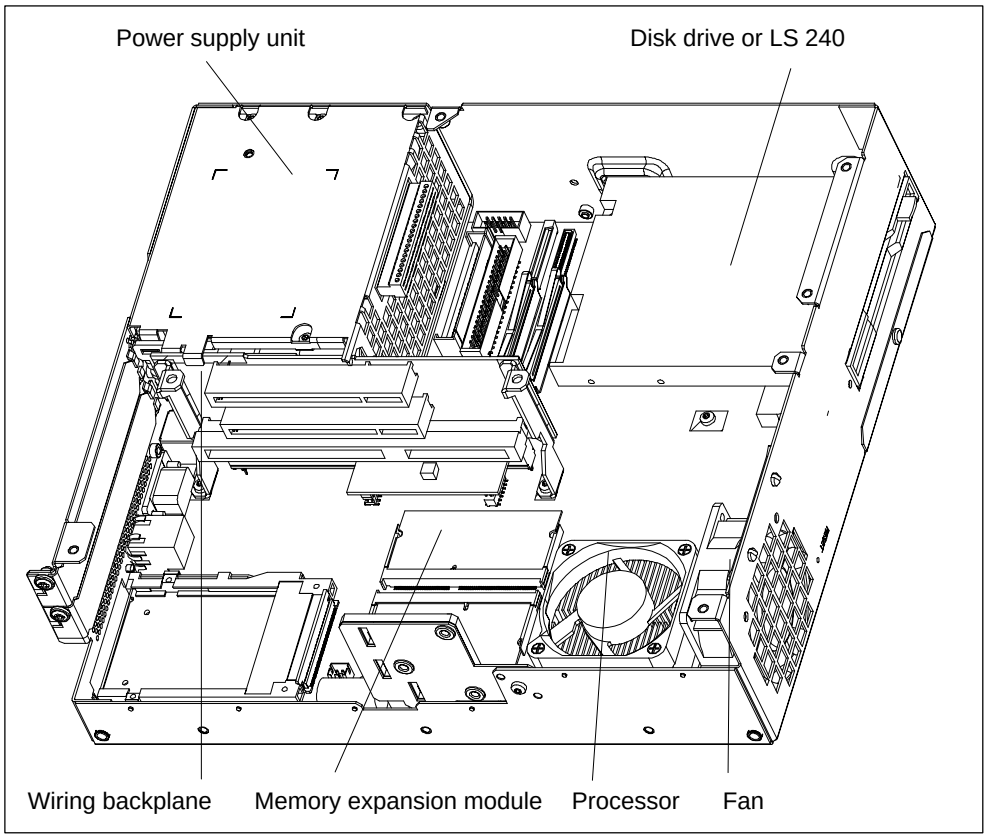

Figure 4-2 Computing unit open

4.1.4 Motherboard

The motherboard is the heart of the computing unit. Here, data are processed and stored, and interfaces and device I/Os are controlled.

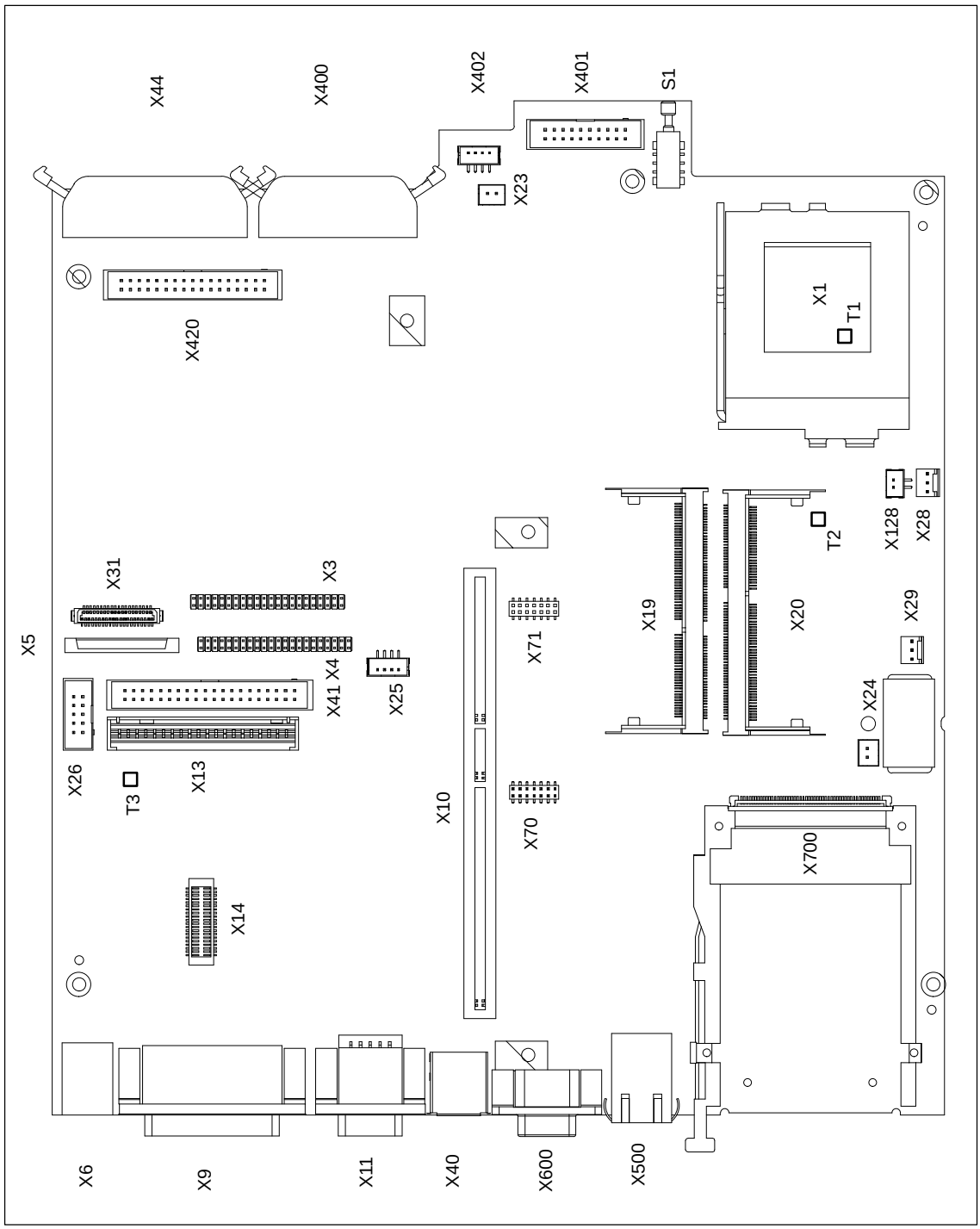

Figure 4-3 Motherboard

Components on the motherboard

The following components are located on the computing unit:

Number	Functions
X1	Processor module with heat sink
X3	IDE connector for CD-ROM
X4	IDE connector for 2.5” hard disk
X5	Floppy disk cable connector
X6	PS/2 mouse connector
X6	PS/2 keyboard connector
X9	Serial port COM 1/TTY
X9	Parallel port LPT 1
X11	Serial interface COM 2
X11	Socket for VGA monitor
X13	Connection for 105 W power supply
X14	Connection for 85 W power supply
X19, X20	System memory, 2 slots
X23	Not connected
X24	Connector for clock battery
X26	Connector, alternative COM2
X28	Not connected
X29	Plug for CPU fan
X31	IDE connector for LS 120
X40	USB bus connector
X41	IDE connector for 3.5” hard disk
X44	Plug for front interfaces
X70, X71	TTY sender/receiver
X128	Connector for unit fan
X400	Connector for LVDS display (3.3 V/5 V)
X401	Not connected
X402	Not connected
X420	Connector for 5 V CMOS display
X500	RJ45 socket for Ethernet LAN
X600	MPI/DP port
X700	PC card slot
S1	Momentary-contact switch for hardware reset
T1	Temperature sensor (in processor)
T2	Temperature sensor
T3	Temperature sensor

4.2 Installation of a Memory Extension

Standard memory

The motherboard has 2 slots for 144 pin SO DIMM memory modules. This allows you to expand the memory capacity of your computing unit to 512 Mbytes.

One or two modules can be equipped.

Memory	Modules		
	64 MB	**128 MB**	**256 MB**
64 MB	1	–	–
128 MB	2	–	–
128 MB	–	1	–
192 MB	1	1	–
256 MB	–	–	1
256 MB	–	2	–
384 MB	–	1	1
512 MB	–	–	2

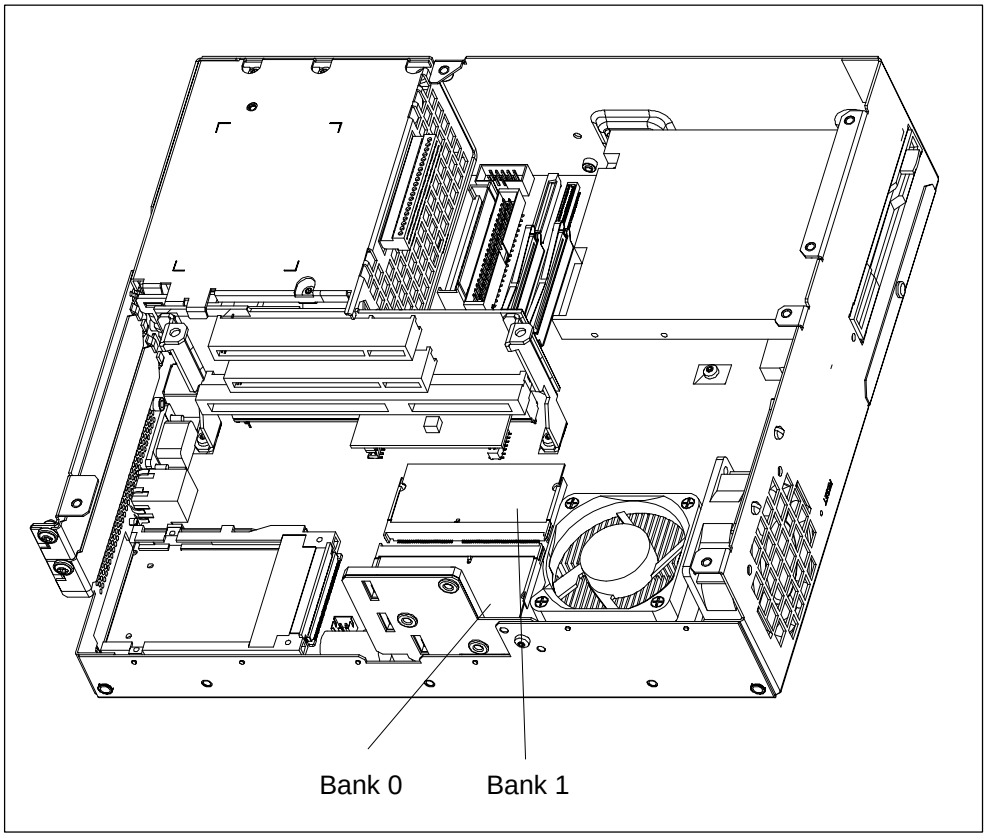

Figure 4-4 Position of SO DIMM memory modules

Caution

The electronic components on the printed circuit boards are extremely sensitive to electrostatic discharge. Certain precautionary measures, therefore, have to be taken when handling them. These measures are explained in the guidelines for electrostatically sensitive devices in Appendix B.

Installing the SO DIMM Modules

To insert the modules, perform the following steps:

1. Open the unit first as described in section 4.1.
2. Insert the modules into the sockets. Note the cutout (locking element) on the connector side of the SO DIMM module.
3. Press the module down applying light pressure until it locks into place.
4. Close the device.

Caution

Danger of damage!

The modules must be fitted firmly in the slots, otherwise they might fall out and be damaged.

Installation

The memory capacity is detected automatically. When you switch on the device, the distribution of base and extended memory is displayed on the screen.

4.3 Replacing the Backup Battery

Battery power supply for real-time clock and configuration

A backup battery (3.6 V lithium battery) powers the real-time clock even after the unit has been turned off. In addition to the time of day, all the information about the device (device configuration) is stored. If the backup battery fails or is removed from its plug, these data are lost.

The clock uses very little power and the lithium battery has a high capacity so that the battery can provide back-up power for the real-time clock for many years. The battery seldom needs to be replaced for that reason.

Battery voltage too low

If the battery voltage is too low, the time is lost, and a correct configuration of the device can no longer be guaranteed.

Replacing the battery

In this case, you must replace the backup battery. The battery is located on the motherboard.

To change the battery, perform the following steps:

1. Disconnect the unit from the mains power supply and then disconnect all the connection cables.
2. Open the device as described in section 4.1.
3. Change the backup battery inserted in the motherboard by pulling out the cable and undoing the cable tie.
4. Secure the new battery in its mounting with a cable tie.
5. Insert the battery connector in the motherboard.
6. Close the device.
7. Connect the unit to the power supply again and press the Reset button (refer to Chapter 4.11).

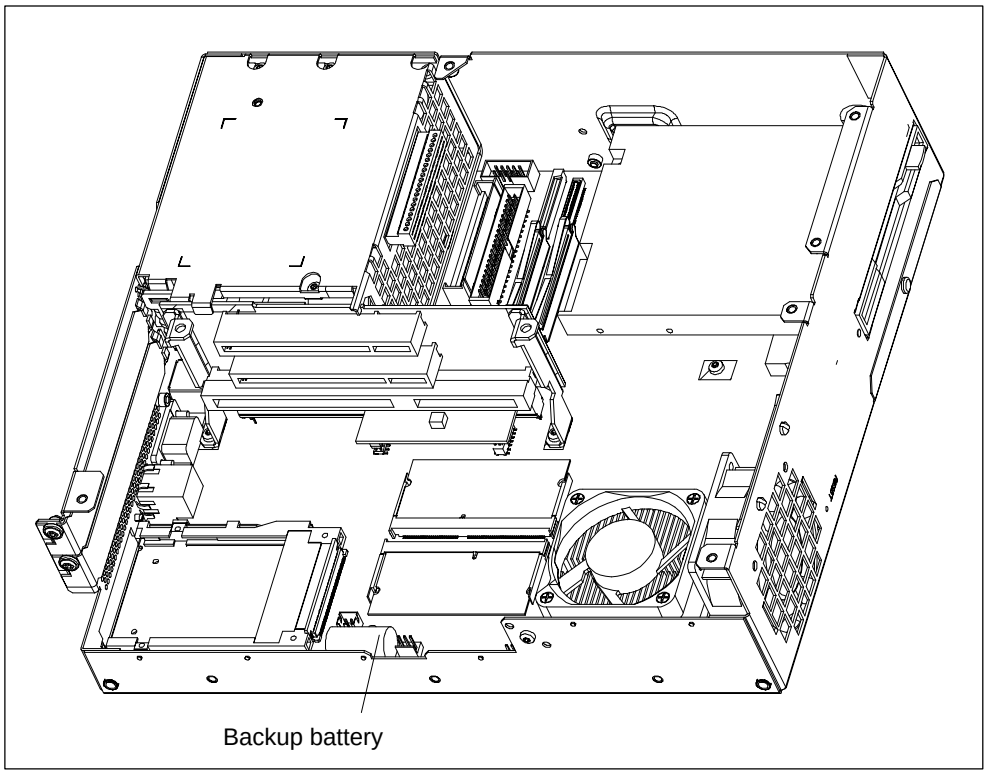

Figure 4-5 Position of the backup battery

Caution

Danger of damage!

Only replace the lithium battery with an identical battery or with a type recommended by the manufacturer (Order No: W79084-E1003-B1).

If possible, return old lithium batteries to the manufacturer or recycling facility or dispose of them as special waste.

Changing SETUP

If you change a battery or unplug the battery connector, you must run SETUP to reset your device's configuration data (refer to Chapter 5).

4.4 Installation of Extension Modules

Notes on the boards

The computing unit is designed for the use of cards as per the AT/PCI specification. The dimensions of the cards must not exceed the stated dimensions. If the height is exceeded, contact problems, malfunctions and difficulties with installation cannot be ruled out. The illustrations show full length AT/PCI cards. Depending on the slot, there might be constraints concerning the overall length.

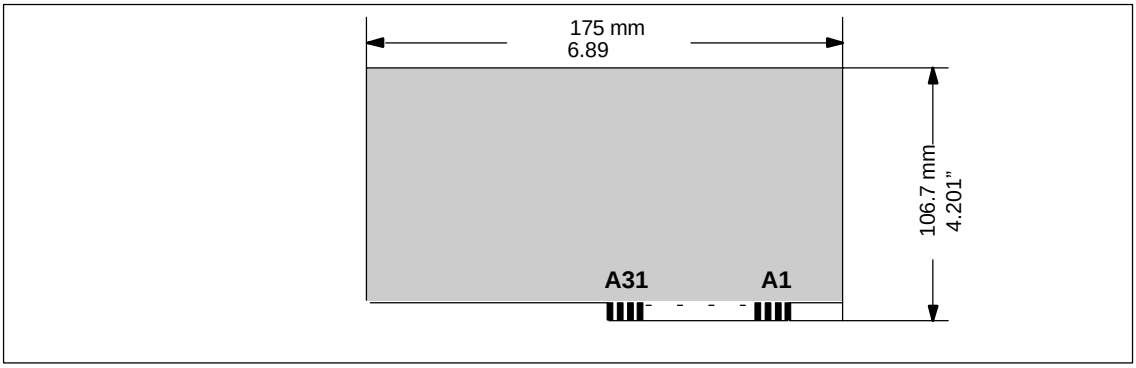

Figure 4-6 XT card

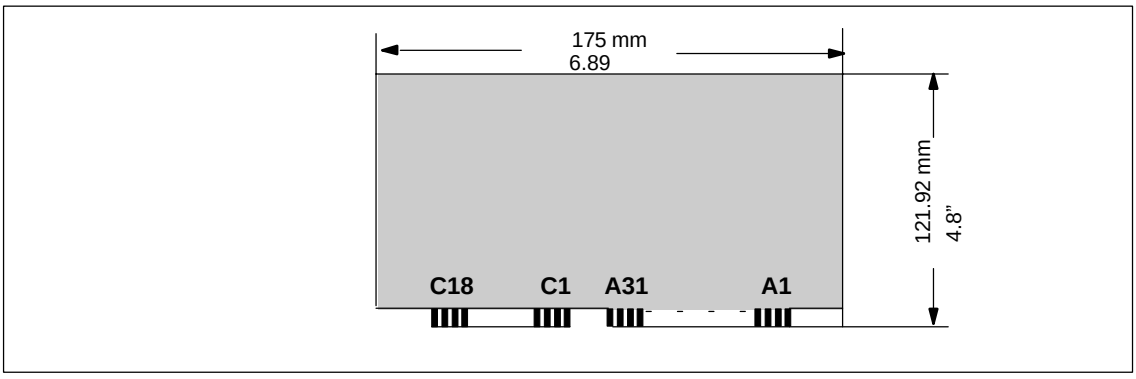

Figure 4-7 AT card

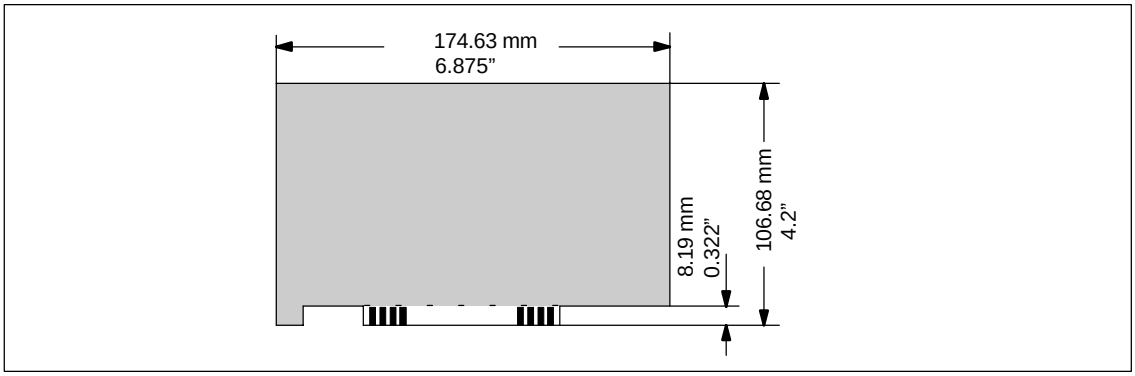

Figure 4-8 Short PCI card (5 V)

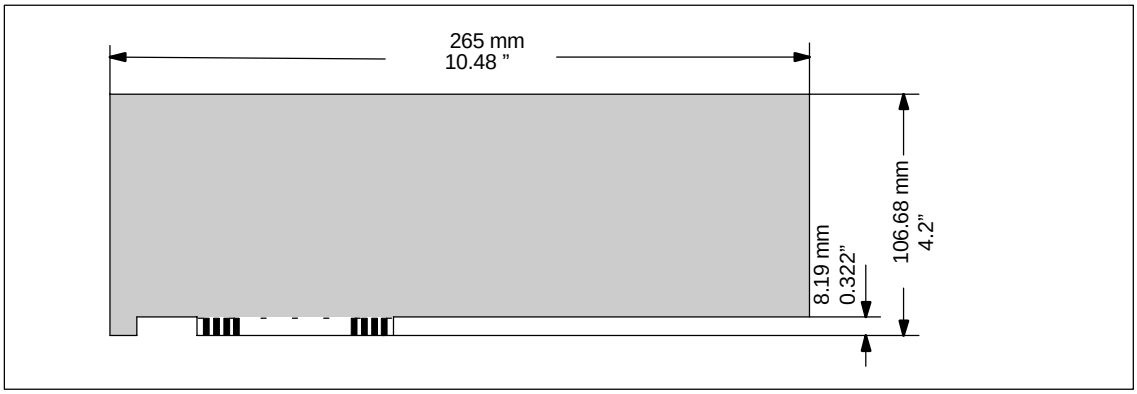

Figure 4-9 Long PCI card (5 V)

Note on long PCI cards

Before long PCI cards can be inserted in the guides of the fan trough, they must be fitted with an extender (this should be included with the long PCI board). Long PCI cards can be inserted in the guides of ISA modules by means of this extender.

4.4.1 Removing and installing the module retainer plates

The module retainer plate is attached to the housing by a screw. It has three slits, through which the slide elements are inserted.

To change the battery, perform the following steps:

1. Open the housing as described in section 4.1.
2. Undo the fixing screw of the module retainer plate.
3. During assembly, ensure that the module retainer plate is resting on the guide on the system housing.

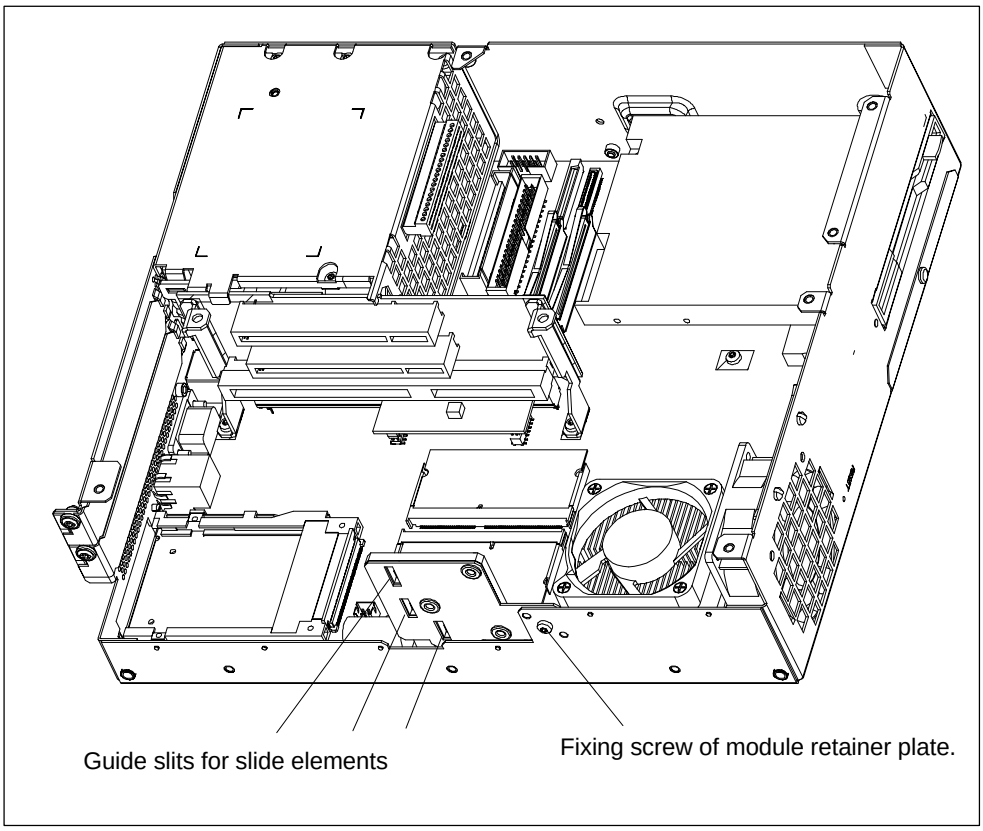

Figure 4-10 Removing and installing an expansion board

Note

The slide elements are in the enclosed bag.

Adjusting the module retainer plate

Proceed as follows to install the module retainer plate.

1. Insert the slide element through the guide slit until it is resting firmly on the module. The module must now be introduced into the notch.

Caution

Do not exert pressure on the module! Therefore, do not use force to press the slide module onto the module.

---

2. Remove the surplus slide element:
   - Score the slide element at the top edge of the support with a knife and snap it off.
   - Nip off the surplus with a sharp side cutter.

4.4.2 Removing and installing an ISA/PCI module

To change the battery, perform the following steps:

1. Open the housing as described in section 4.1.
2. Disconnect all the connectors from the expansion module and note their assignment.
3. Remove the module retainer plates as described in section 4.4.1.
4. Undo the screw on the slot plate of the module.
5. Pull the module out of its slot.
6. Proceed in the reverse order to install the new expansion module.

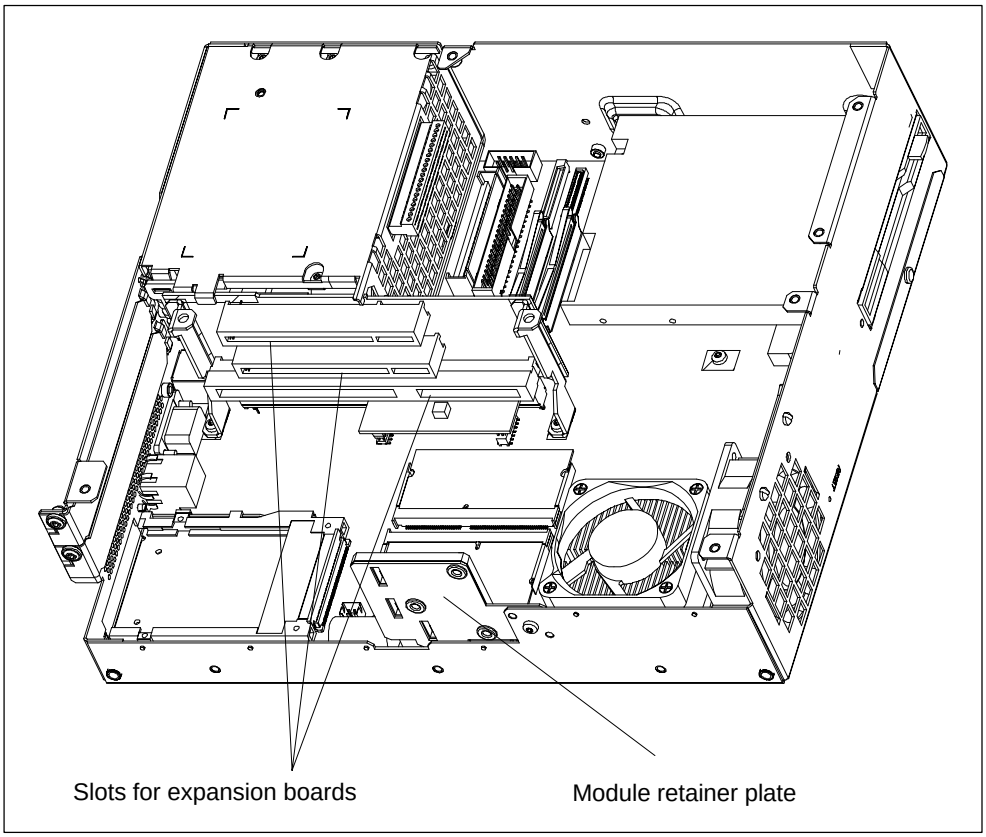

Figure 4-11 Removing and installing an expansion board

4.5 Removing and Installing Drives

The basic configuration of the computing unit includes a 3.5” floppy disk drive and a 3.5” hard disk drive. An LS 240 drive is possible for custom solutions.

4.5.1 Removing and installing the hard disk drive

1. Remove the 4 screws on the back of the system housing.
2. Swing open the drive cage.
3. Detach the drive holder from its mounting and place it face down on the housing.
4. Make a note of the cable assignment and detach the cables.
5. Loosen the 4 screws with which the hard disk drive is secured to the shock absorbing part of the holder. Remove the hard disk drive from the holder.
6. Proceed in the reverse order to install the new drive. The new drive must be of the same type as the one removed.

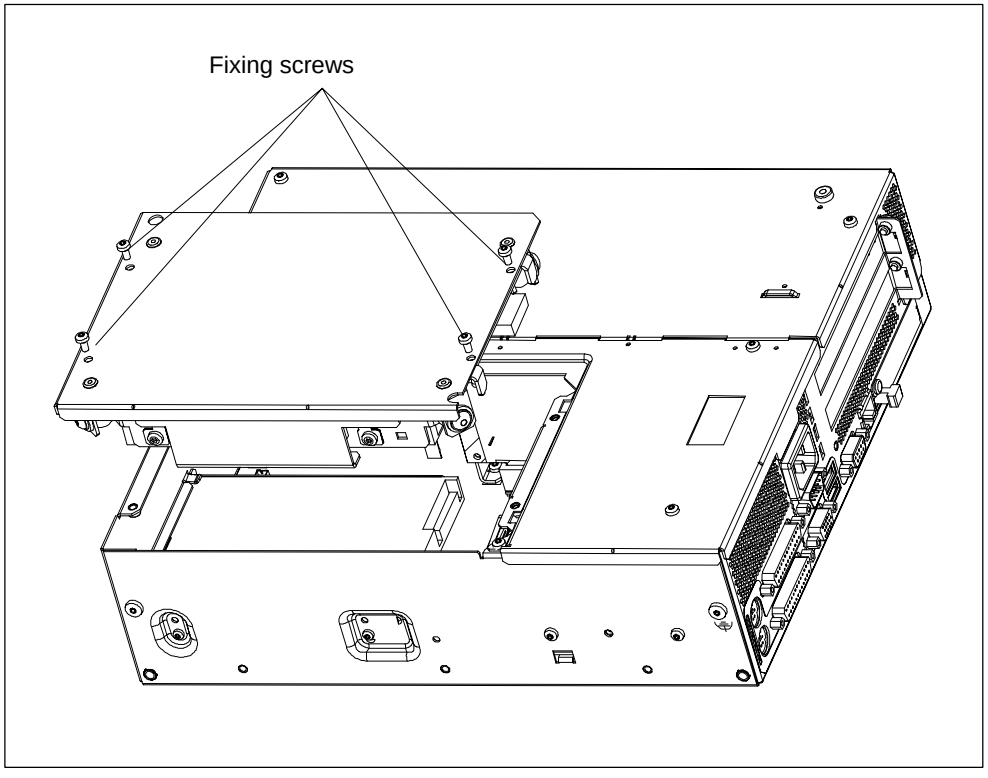

Figure 4-12 Removing and installing the drive holder

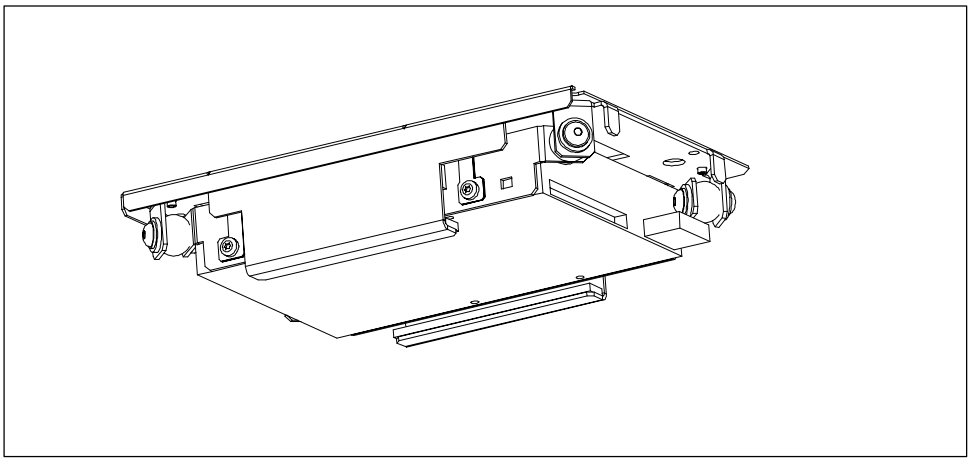

Figure 4-13 Hard disk drive, with holder, removed

4.5.2 Removing and installing a CD-ROM drive

Depending on the hardware configuration of the device, a CD-ROM drive is installed on the computing unit. The installation depth of the computing unit is increased by 21 mm as a result of its installation.

1. Undo the 2 screws on the back of the system housing.
2. Remove the cover of the CD-ROM drive.
3. Undo the three screws which secure the CD-ROM on the mounting.
4. Remove the CD-ROM drive from the mounting and carefully pull off the data cable.
5. Proceed in the reverse order to install the new drive.

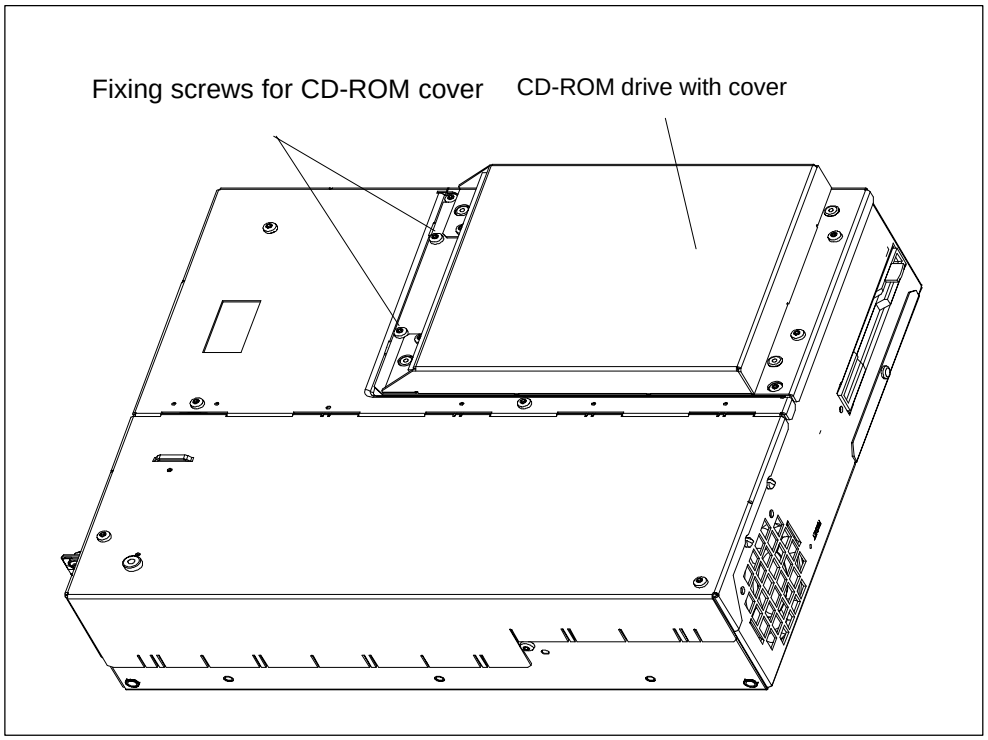

Figure 4-14 Computing unit with CD-ROM drive

4.5.3 Removing and installing the disk drive

1. Open the housing as described in Chapter 4.1.
2. Remove the drive mounting as described in section 4.5.1.
3. Undo the interlocking of the controller flexible cable on the motherboard and pull the flexible cable out of the plug connection.
4. Undo the two fixing screws (TORX T8) on the housing.
5. Lift the floppy disk drive up and out of the housing.
6. Proceed in the reverse order to install the new drive. The new drive must be of the same type as the one removed.

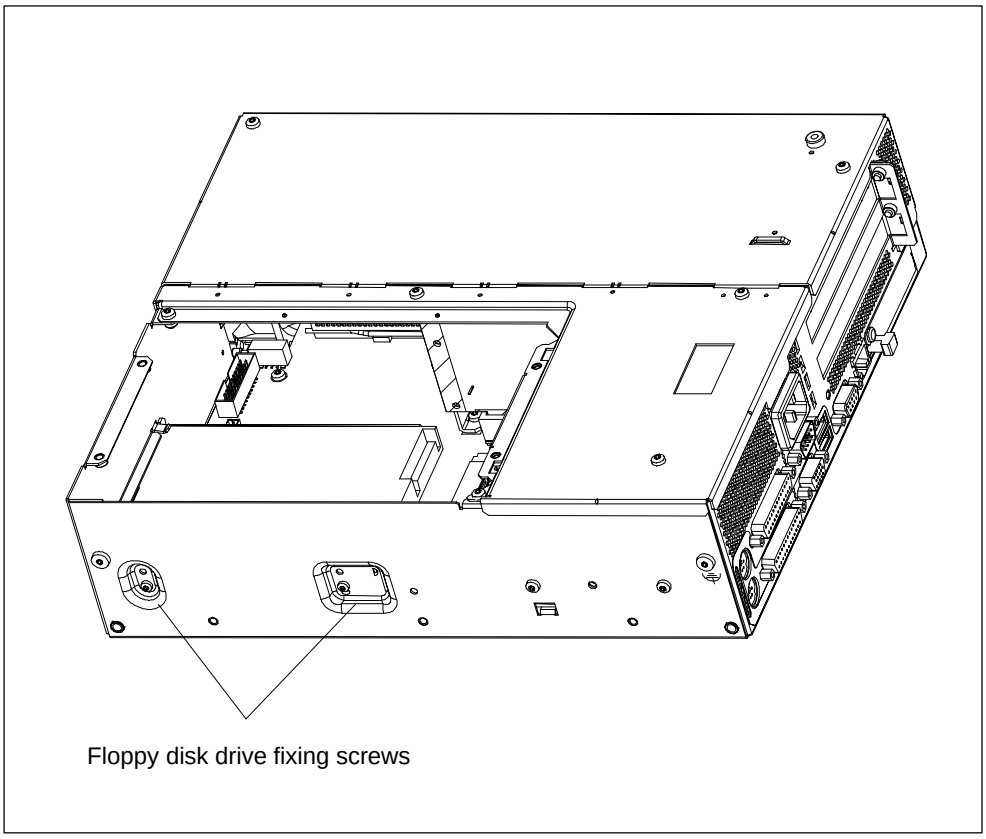

Figure 4-15 Assembly of the computing unit floppy disk drive

4.5.4 Removing and installing the LS 240 drive

To remove and install the LS240 drive, perform the same steps as for installing the floppy disk drive.

1. Open the housing as described in Chapter 4.1.
2. Remove the drive mounting as described in section 4.5.1.
3. Release the cable clamp assembly of the controller flexible cable on and pull the flexible cable out of the plug connection.
4. Undo the two fixing screws (TORX T8) on the housing.
5. Lift the LS240 drive up and out of the housing.
6. Proceed in the reverse order to install the new drive.

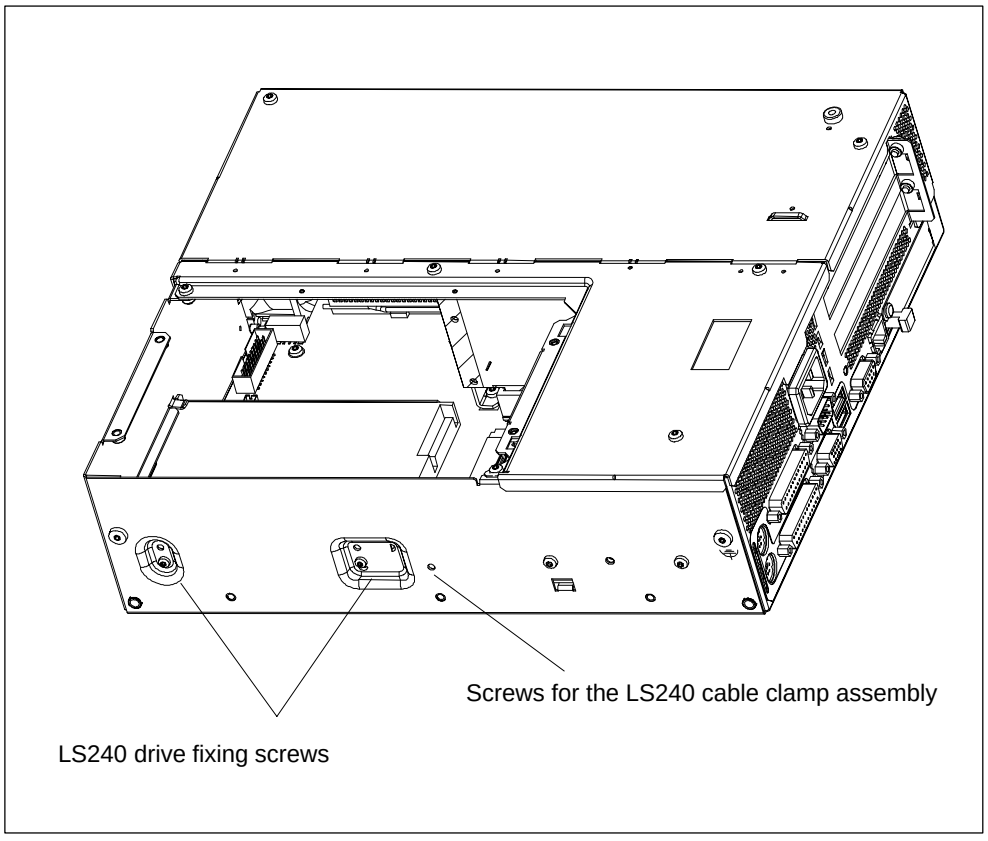

Figure 4-16 Assembly of the LS240 drive

4.6 Removing and Installing the Power Supply

1. Open the housing as described in section 4.1.
2. Remove the drive mounting as described in section 4.5.1.
3. Remove the 3 screws from the cover of the power supply unit from the housing.
4. Disconnect the internal SV cable on the power supply (only applicable to units with 105 W power supplies).
5. Remove the two fixing screws (TORX T10) on the housing.
6. Pull the power supply unit up and out of the housing.
7. Proceed in the reverse order to install the new power supply unit.

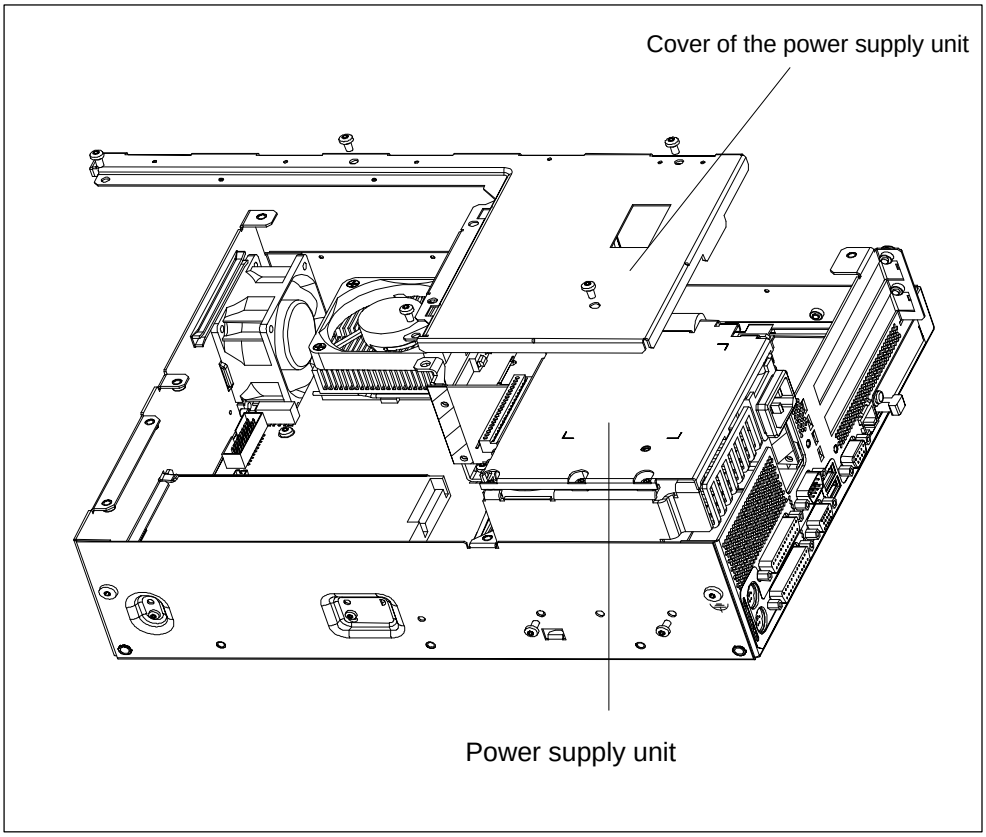

Figure 4-17 Removing and installing the power supply

4.7 Removing and Installing the Bus Board

1. Open the housing as described in section 4.1.
2. Remove all the modules from their slots (perform the steps described in section 4.4.2).
3. Remove the drive mounting as described in section 4.5.1.
4. Remove the power supply unit as described in section 4.6.
5. Undo the screw on the motherboard.
6. Pull the wiring backplane from the motherboard.
7. Proceed in the reverse order to install the new wiring backplane.

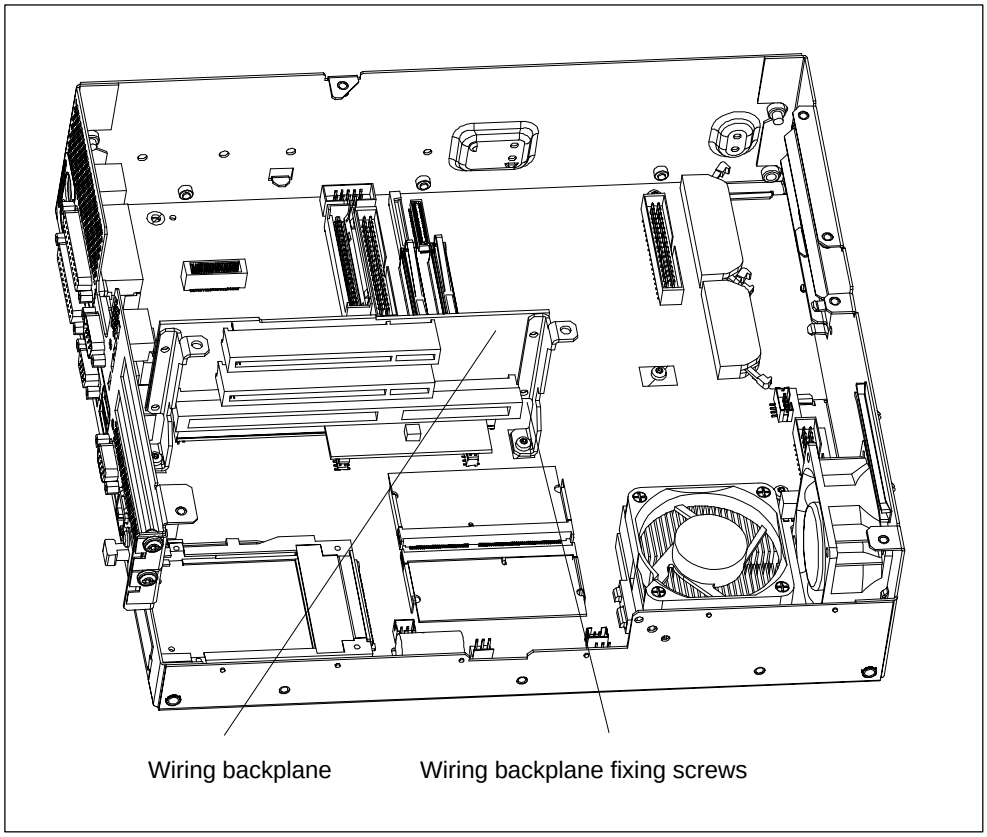

Figure 4-18 Removing and installing the bus board

4.8 Removing and Installing the Motherboard

1. Open the housing as described in section 4.1.
2. Remove all the modules from their slots (perform the steps described in section 4.4.2).
3. Remove the drive mounting as described in section 4.5.1.
4. Remove the power supply unit as described in section 4.6.
5. Undo 7 screws on the motherboard and undo 10 hexagon head cap screws at the interfaces.
6. Remove the wiring backplane and the motherboard.
7. Proceed in the reverse order to install the motherboard.

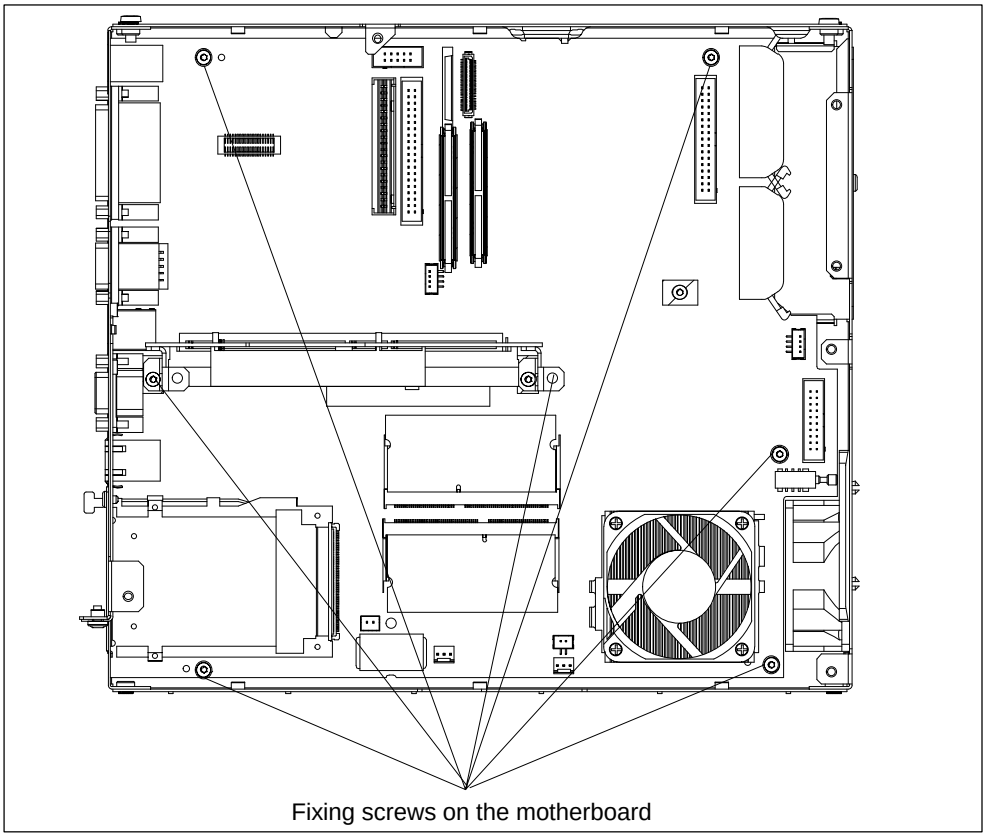

Figure 4-19 Fixing screws on the motherboard

The motherboard is supplied as a spare part without a processor, memory modules or wiring backplane.

4.9 Removing and Installing the Fan

The computing unit is cooled by means of a fan, which extracts hot air out of the housing.

1. Open the housing as described in section 4.1.
2. Disconnect the fan cable connector from the motherboard.
3. The fan is secured to the housing by two plastic rivets. Undo the rivets by pressing out the gudgeon from the rear of the rivet shank.
4. Remove the fan.
5. Proceed in the reverse order for assembly.

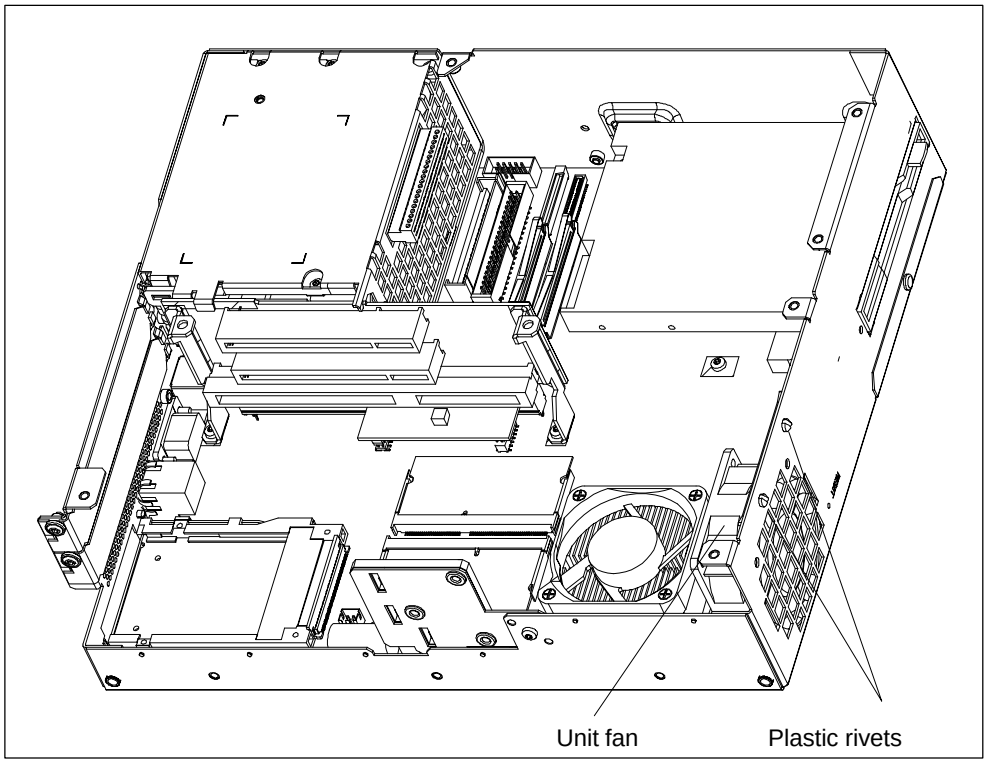

Figure 4-20 Removing and installing the fan

Notice

Fit only a fan of the same type!

Caution

To ensure that the device is adequately cooled, ensure that the running direction of the fan is correct when installing.

Ensure that the arrow on the fan is pointing towards the housing wall.

4.10 Processor Upgrade

You can boost the performance capability of your computing unit by installing other processors. Proceed as follows to replace the processor (the numbers in brackets relate to Figure 4-21):

1. Disconnect the fan cable connector from the motherboard.
2. Remove the heat sink, secured by a metal bar.
3. Press the lever in the direction of the arrow (1) and pivot it up as far as possible (2).
4. Lift the old processor from the slot (3).
5. Insert the new processor in the slot ensuring that the marking on the top side of the processor coincides with the position of the marking (4) on Slot A.

Caution

The marking on the top side of the processor may be covered by the heat sink. In such cases, align the processor with the marking in the row of pins at the bottom of the processor.

---

6. Pivot the lever back down until it locks into place (5).
7. Disassemble the unit fan.
8. Secure the heat sink with the metal bar.
9. Connect the fan cable connector back on the motherboard.
10. Assemble the unit fan.

Caution

If the processor is driven with a frequency higher than permitted, it may be destroyed or cause loss of data or loss of data integrity.

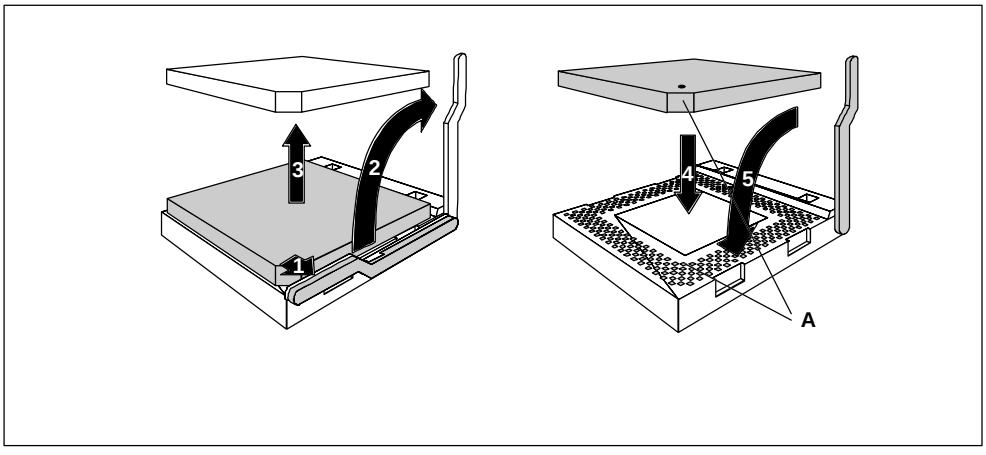

Figure 4-21 Upgrading the processor

4.11 Reset button

A hardware reset is initiated by means of the Reset button on your device. The computing unit is restarted.

On the computing unit, the Reset button is located on the drive side beside the floppy disk drive. The Reset button can only be operated with the aid of a pointed object (e.g. the tip of a ball-point pen or straightened paper clip). The position of the Reset button is marked in the illustration of the computing unit below.

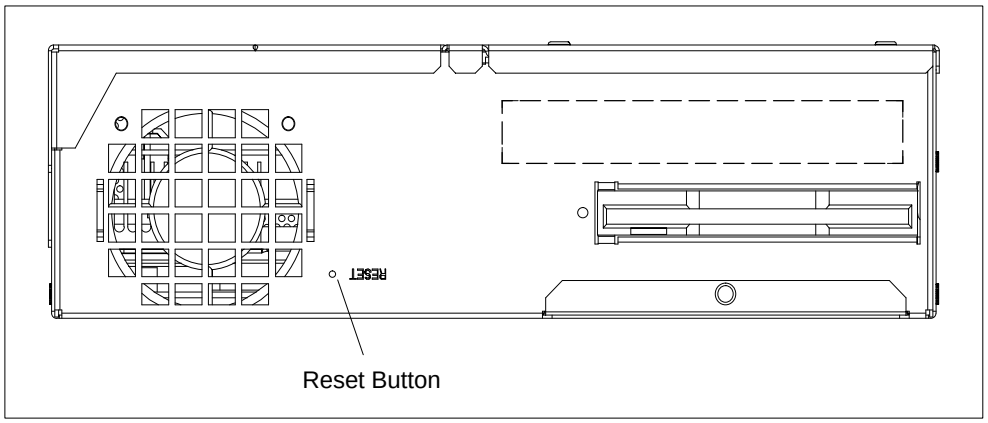

Figure 4-22 Reset button

Configuring the Computing Unit in BIOS Setup

5

Chapter Overview

In this chapter, you will learn how to configure your computing unit. You need to do this if you want to change your system by adding, removing, or exchanging an extension board, memory expansion module, or by replacing a system module.

In Section	You Will Find	on Page
5.1	Modifying the Device Configuration with SETUP	5-2
5.1.1	The *Main* Menu	5-5
5.1.2	The *Advanced* Menu	5-15
5.1.3	The *Security* Menu	5-22
5.1.4	The *Power* Menu	5-24
5.1.5	The *Boot Sequence* Menu	5-25
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5.1 Modifying the Device Configuration with SETUP

Changing the Device Configuration

The device configuration of your computing unit is preset for working with the software supplied to you. You should only modify the preset values if you have performed technical modifications to your device or if a fault occurs when the unit is powered up.

BIOS SETUP Program

The SETUP program is in the ROM-BIOS. The system configuration settings are stored in the battery-protected memory of the computing unit.

You can use BIOS Setup to set the hardware configuration (for example, hard disk type) and define the system characteristics. You can also use SETUP to set the time of day and date.

Incorrect BIOS Data

If there are detected incorrect BIOS data during the boot process you are asked by the BIOS to

- Start BIOS SETUP by pressing *F2* or
- continue booting by pressing *F1*.

start SETUP

On completion of the startup test, the BIOS gives you the opportunity of starting the SETUP program The following message appears on the display:

```
PRESS < F2> to enter SETUP
```

To start SETUP, proceed as follows:

1. Reset the computing unit (warm or cold reset).
2. Press the key *F2* until the BIOS message is displayed.

BIOS SETUP menus

The various menus and submenus are listed on the following pages. You will find information on the **"Item Specific Help"** part of the specific menu for the selected SETUP value.

Screen Display Following Power On

For example, the default setting of your computing unit will display the following figure on the display on power on:

```
Phoenix BIOS 4.0 A5E00123801–ES02
Copyright 1985-2001 Phoenix Technologies Ltd.
All Rights Reserved.

SIMATIC Box PC 620 V02.01.02
CPU = Pentium[III  866MHz
637K System RAM Passed
119MB Extended RAM Passed
0128K Cache SRAM Passed
System BIOS shadowed
Video BIOS shadowed
UMB upper limit segment address: ....
Fixed Disk 0: xxxx
ATAPI CD-ROM: Txxx
Mouse initialized
Press  to enter SETUP
```

By pressing the *F2* key when the above figure is displayed you will change to the BIOS Setup program based on the ROM. In this program, you can set a number of system functions and hardware configurations of your programming device.

The default settings are effective on delivery. You can change these settings using the BIOS setup. The modified settings become effective when you have saved them and terminated the BIOS setup.

The following screen shots may differ from what is shown here, depending on the device configuration.

Menu items

After BIOS Setup has started, the following dialog box appears on the screen:

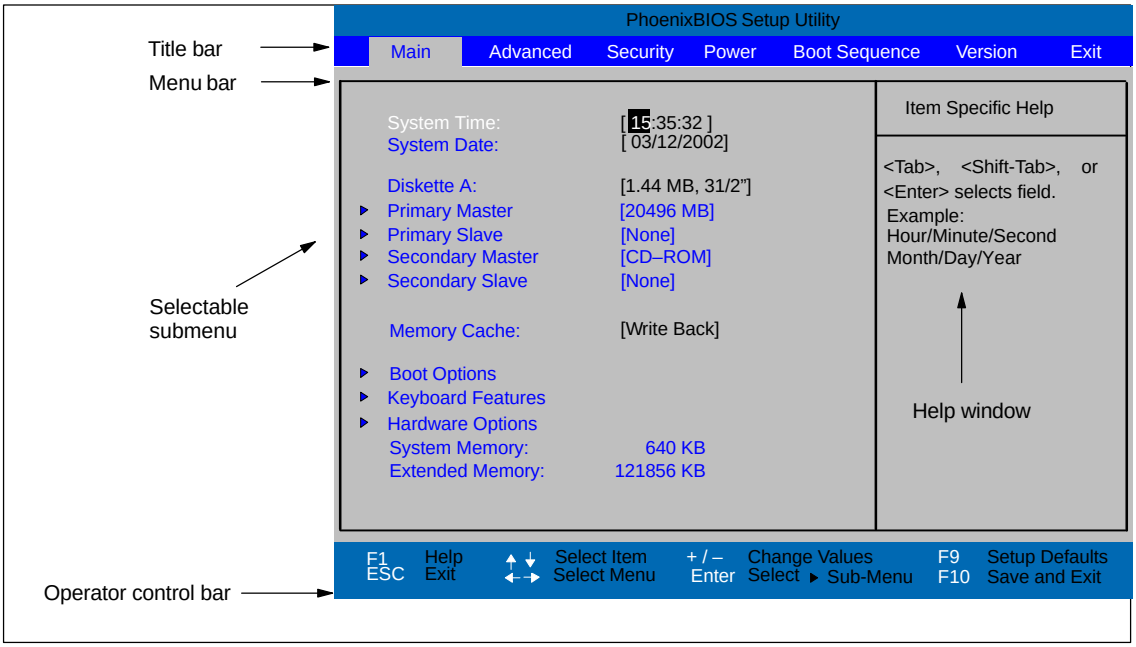

Figure 5-1 SETUP Main Menu (Example)

The screen is divided into four sections. In the top section, you can select the menu screens [Main], [Advanced], [Security], [Power], [Boot Sequence], [Version], [Exit]. In the left of center section, you can choose the different settings or submenus. Brief help texts appear on the right for the currently selected menu entry. The bottom section contains information for operator inputs.

Yellow stars to the left of the interface designation (for example, Internal COM 1) indicate a resource conflict between the interfaces managed by the BIOS. In this case you should select the default settings (F9) or eliminate the conflict.

You can move between the menu screens using the cursor keys [←] and [→].

Menu	Meaning
Main	System functions are set here
Advanced	An extensive system configuration can be performed here
Security	Security functions are set here, for example a password
Power	Power conservation functions can be chosen here
Boot Sequence	The boot priorities are set here
Version	Information about the programming device's release status
Exit	Used for exiting and saving

5.1.1 Menu *Main*

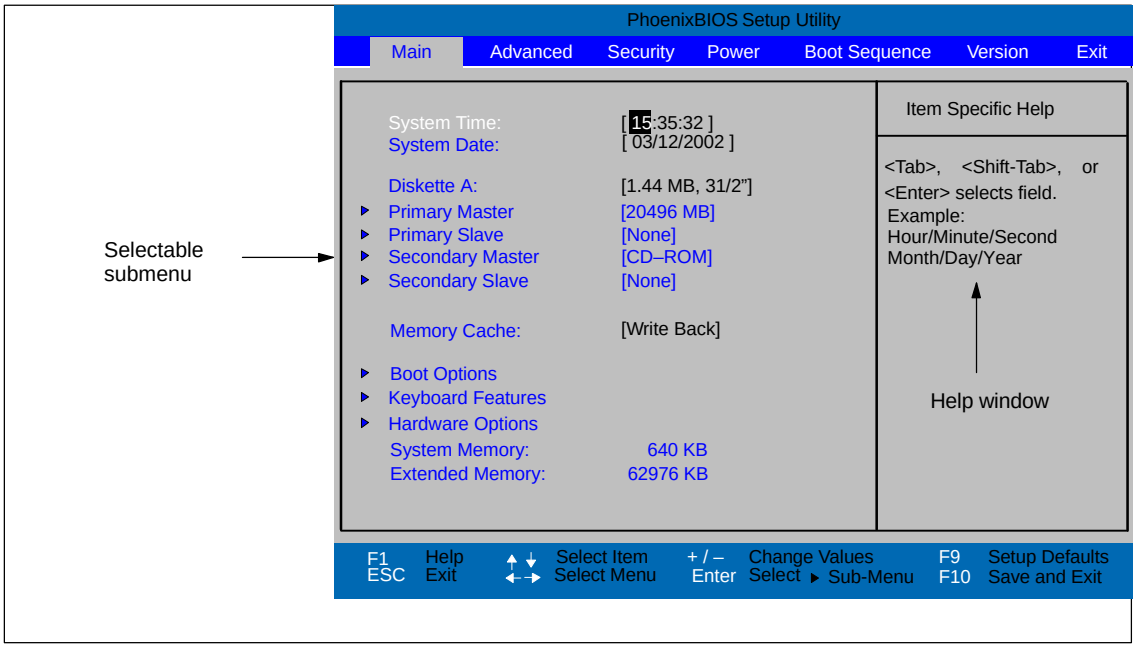

Figure 5-2 SETUP Main Menu (Example)

Setting in the Main Menu

In the **Main** menu, you can move upwards and downwards using the cursor keys [↑] and [↓] to select the following system parameters:

Field	Meaning
System Time	For viewing and setting the current time
System Date	For viewing and setting the current date
Disk A:	Type of built in floppy disk drive With LS 240 drive [Disabled]
Memory Cache	For setting the cache options
by submenus	
Primary Master	Type of build in drives
Secondary Master	Type of build in drives
Boot Options	For setting boot options
Keyboard Features	For setting keyboard interface options (e.g. NUM Lock, Typematic Rate)
Hardware Options	For setting hardware options

System Time und System Date *Time and date*

System Time and System Date indicate the current values. Once you have selected the appropriate option, you can use the [+] and [–] keys to modify the time setting

`Hour:Minute:Second` and the date

`Month/Day/Year`.

You can move between the entries in the date and time options (for example, from hour to minute) using the tabulator key.

Floppy disk A *Floppy disk drive*

Here you can set up the floppy disk drive of your specific computing unit. The following entries are possible:

[Disabled]	if there is no floppy disk drive and there is a LS 240 drive. Default setting for an installed LS 240 drive.
[360 KB,5 1/4”]	
[1.2 MB,5 1/4”]	
[720 KB,3 1/2”]	
[1.44 MB, 3 1/2”]	Default setting for an installed floppy drive A
[2.88 MB, 3 1/2”]	

Primary Master, *Primary Slave, Secondary Master, Secondary Slave*

The system jumps to the following submenu when you select this type of menu field:

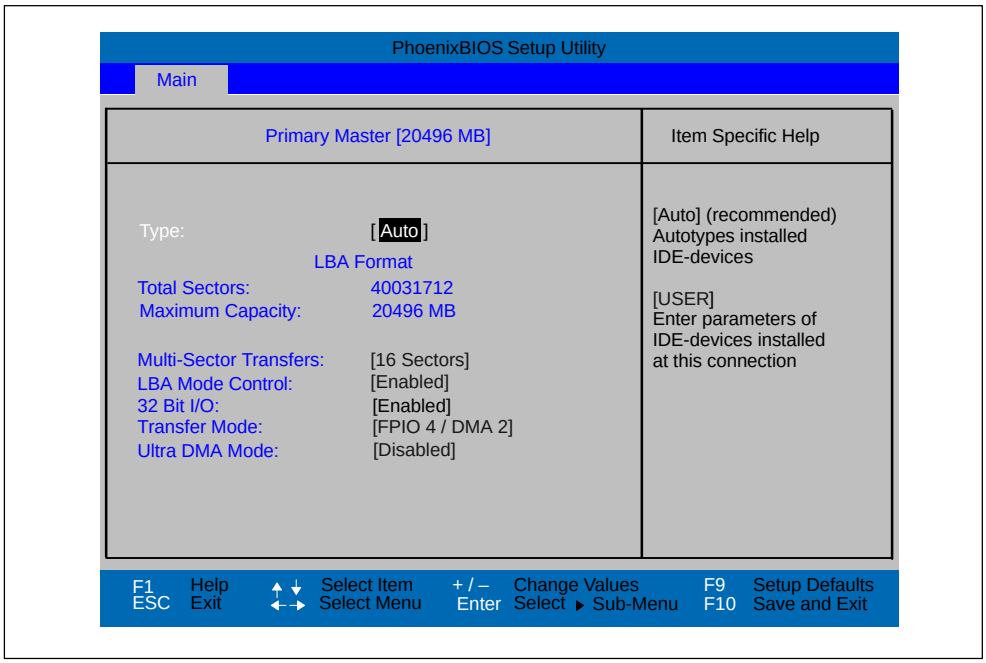

Figure 5-3 Primary Master

Field *Type*

The parameters you can select here are normally stored on your IDE drive. The 'Auto' setting in the *Type* field means that these values are automatically read from the drive and written into memory (**Autodetect**).

If *Type* is selected for a drive that cannot be detected, a timer times out in approximately 1 minute and the entries remain unchanged. You should always check that the interfaces for which you select 'Auto' are in fact connected to drives.

Select "User" if you want to define the hard-disk type yourself, in which case remember that you also have to set the other fields, including Cylinder, Heads, Sectors/Track and WritePrecomp, to the correct values for the type of hard disk in question.

Multi Sector Transfer field

In the box *Multi Sector-Transfer* the number of blocks (sectors) are defined that will be transmitted with one interrupt. The value depends on the drive and should be set only by setting the *Type* field to ”Auto”.

```
Disabled
2,4,8,16    sectors
```

LBA Mode Control field

If the *LBA Mode Control* field (enabled,disabled) is set to ’Enabled’, the system supports hard disks with capacities greater than 528 Mbytes. The value depends on the drive and should be set only by setting the *Type* field to ”Auto”.

32 Bit-IO field

The box *32 Bit-IO* defines the access type for the drive

```
Disabled    16-Bit access
Enabled     32-Bit access     (default)
```

Transfer Mode and *Ultra DMA Mode* fields

The settings in these fields define the interface’s data transfer rate. The value depends on the drive and should be set only by setting the *Type* field to ”Auto”.

Hit ESC to exit the submenu.

”Memory Cache” Submenu

The following pop-up menu appears when you select the submenu “Memory cache” in the main menu:

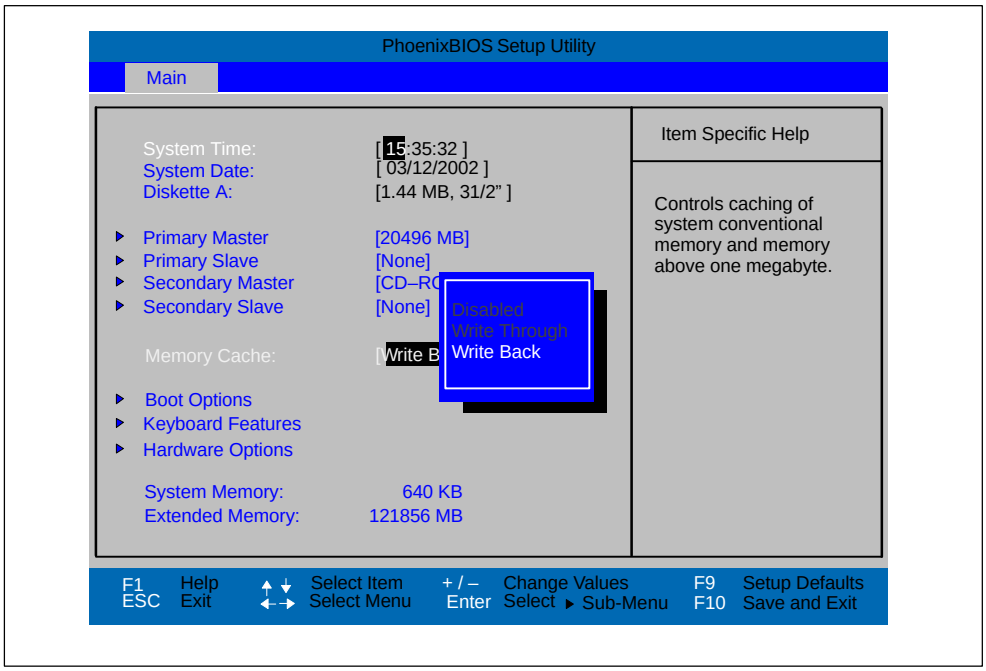

Figure 5-4 “Memory Cache” Field

A cache is a fast memory buffer between the CPU and main memory (DRAM). Recurrent memory access operations are executed in the fast cache, instead of the main memory, if the function is enabled. In rare instances involving some hardware and software combinations, it may be necessary to disable the cache because the program runtimes or waits are too short on account of the fast cache.

[Disabled]	Cache is disabled
[Write Through]	Write access is not concluded until the entry has been made in main memory
[Write Back]	Write access is concluded immediately; the entry in main memory takes place in the backround (default)

Submenu ”Boot Options”

The following submenu appears when you select the option “Boot Options” in the main menu:

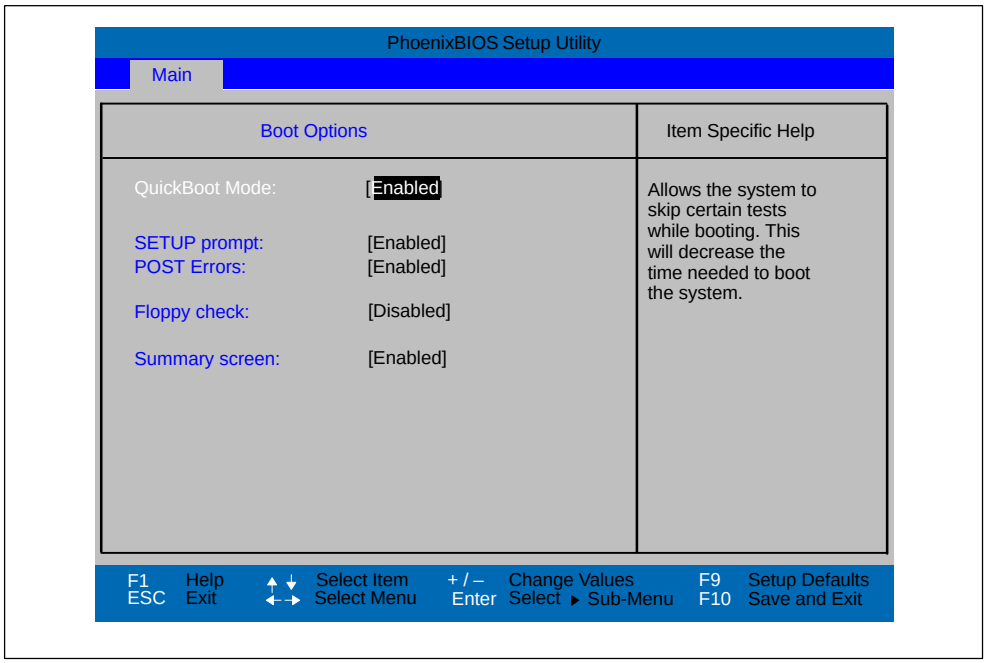

Figure 5-5 ”Boot Options” Submenu

Quick Boot Mode	Some hardware tests are skipped when the system starts up, thus speeding up the boot procedure.
SETUP prompt	The message *PRESS <F2> to enter Setup* appears at the bottom of the screen during the system load phase.
POST Errors	The boot process is stopped if an error is detected; you must press F1 to acknowledge. Enter “Disabled”to avoid the necessity of acknowledging errors, for example if no keyboard is connected.

Floppy check	The floppy head is stepped inward and then back to its original position during the system run-up phase. This test is useful because it reinitializes the drive.
Summary screen	The most important system parameters are displayed when the system run-up phase completes.

'Enabled' means that the feature is active. 'Disabled' means that the feature is inactive.

Example of a summary screen:

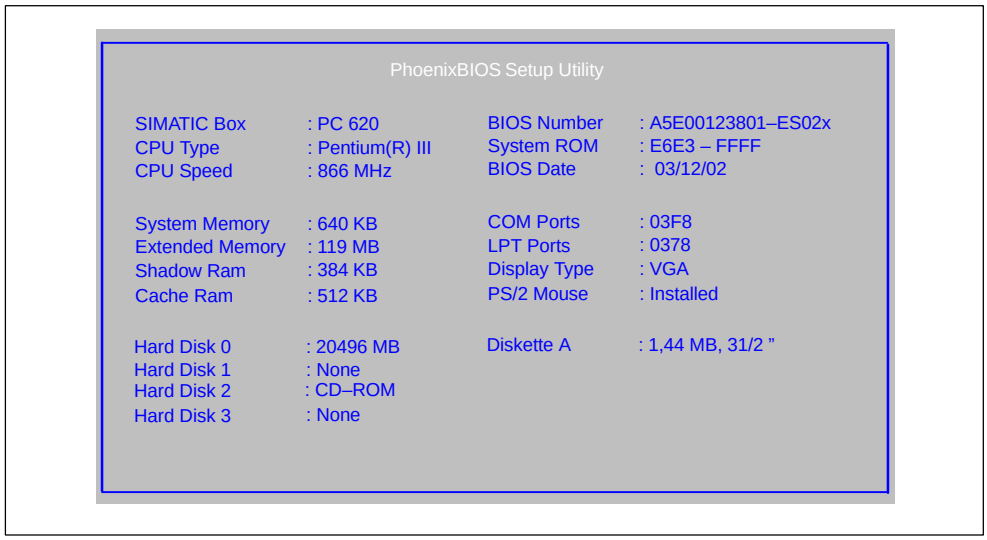
PhoenixBIOS Setup Utility
SIMATIC Box : PC 620
CPU Type : Pentium(R) III
CPU Speed : 866 MHz
BIOS Number : A5E00123801–ES02x
System ROM : E6E3 – FFFF
BIOS Date : 03/12/02
System Memory : 640 KB
Extended Memory : 119 MB
Shadow Ram : 384 KB
Cache Ram : 512 KB
COM Ports : 03F8
LPT Ports : 0378
Display Type : VGA
PS/2 Mouse : Installed
Hard Disk 0 : 20496 MB
Hard Disk 1 : None
Hard Disk 2 : CD–ROM
Hard Disk 3 : None
Diskette A : 1,44 MB, 31/2 "

Figure 5-6 Summary Screen

The Summary screen appears when the system run-up phase completes.

Submenu ”Keyboard Features”

The following submenu appears if you select the “Keyboard Features” field in the main menu:

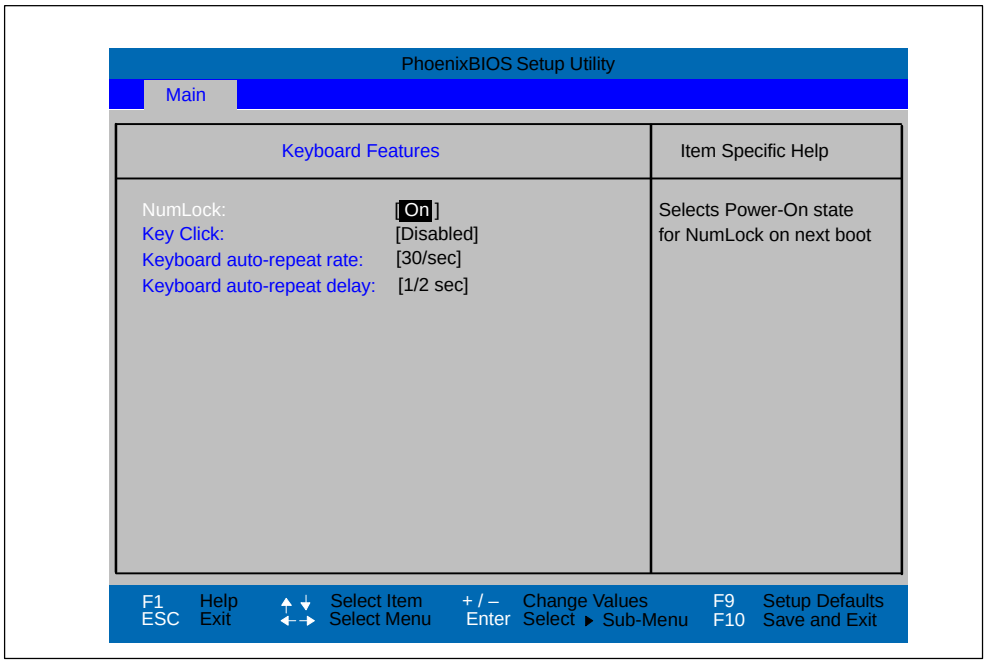

Figure 5-7 ”Keyboard Features”Submenu

Numlock	Switches Numlock on or off following power on
Key Click	A keystroke can be heard
Keyboard auto-repeat rate	Increase in automatic key repeat rate

Submenu ”Hardware Options”

The following submenu appears when you select the “Hardware Options” field in the main menu:

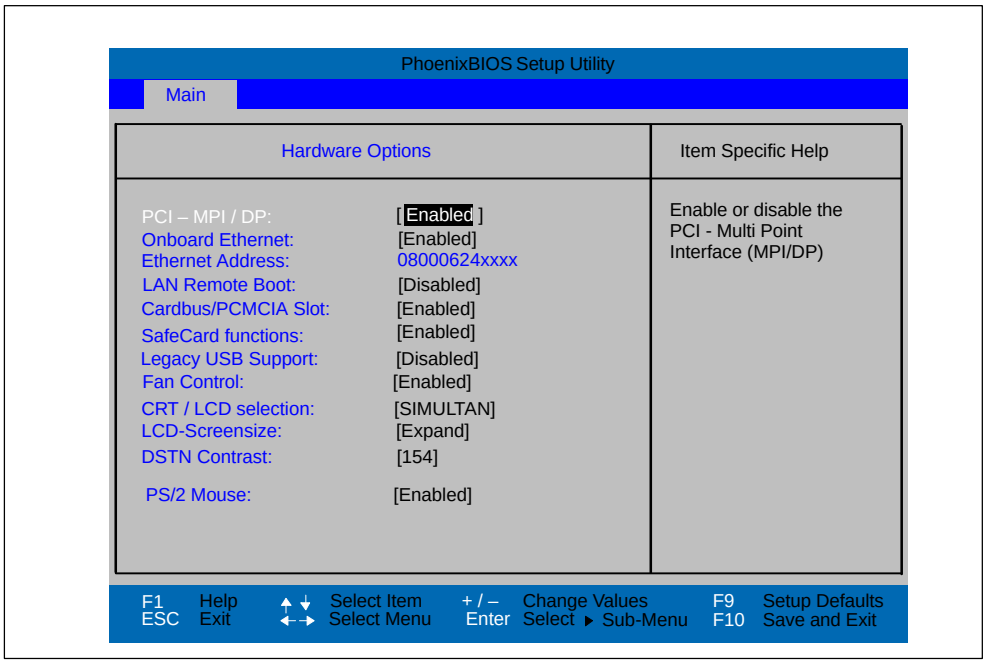

Figure 5-8 ”Hardware Options” Submenu

The parameters of the interfaces present on the basic module are set here.

Entry	Meaning
PCI-MPI/DP	Enables the CP5611-compatible MPI/DP interface. The recourses are managed by the BIOS PCI plug and play mechanism.
On Board Ethernet	[Enabled] The ethernet port on the motherboard is enabled. [Disabled] The ethernet port on the motherboard is disabled.
Ethernet Address	The individual ethernet address is displayed here.
LAN Remote Boot	[Enabled] It is possible to boot over a connected LAN. The respective boot source is displayed as Intel® Boot-Agent in the boot sequence menu [Disabled] Booting using LAN is not possible.

Entry	Meaning	
Card bus / PCMCIA Slot	[Disabled]	Release the Cardbus / PCMCIA interfaces is disabled.
	[Enabled]	The resources are managed by the BIOS PCI plug and play mechanism.
SafeCard functions	[Enabled]	On board monitoring functions are enabled.
	[Disabled]	No monitoring functions.
	The relevant driver and application must be started for operation of the monitoring functions.	
Legacy USB Support	[Disabled]	In order to connect a USB keyboard or a USB mouse the operating system has to support USB devices. You can adjust the Setup settings with a USB keyobard.
	[Enabled]	USB keyboard and USB mouse are supported by the BIOS. Non-USB capable operating systems can be used.
CRT / LCD selection	[LCD Enabled]	All data is output only to the internal LCD, the 15-way VGA port is disabled
	[CRT Enabled]	for the highest resolution the display signals are only sent to the 15-pin VGA interface. The LCD interface of the VGA controller is disconnected.
	[SIMULTAN]	Both display interfaces are enabled and operate simultaneously. Note, however, that the LCD does not support all resolutions.
LCD-Screen-size	[Normal]	The display window in Text and Graphic modes is not expanded to full screen size.
	[Expanded]	The whole display area is used even if the resolution is higher than the pixel size of the monitor.
DSTN Contrast	The contrast of DSTN displays is set here. Range: 0-255	
PS/2 mouse	[Internal]	The PS/2 port is activated. This is the default for the Box PC. IRQ 12 is assigned.
	[Disabled]	The PS/2 port is deactivated, IRQ12 is available.
	Note:	Invariably, changes to this interface do not come into effect until the PC is switched off and on again.

5.1.2 Menü *Advanced*

Menu structure

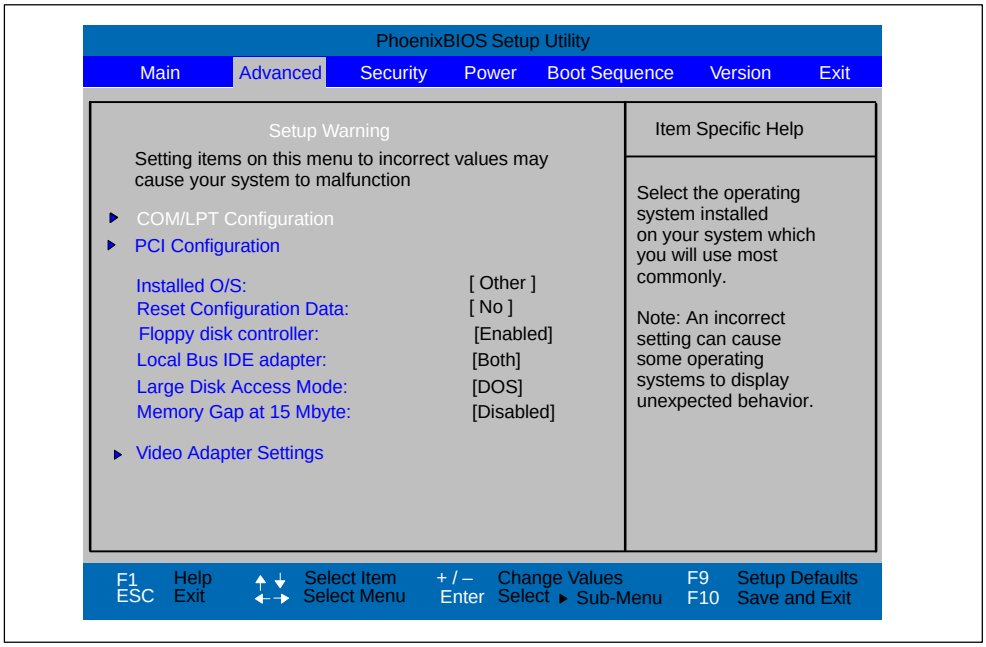
PhoenixBIOS Setup Utility
Main
Advanced
Security
Power
Boot Sequence
Version
Exit
Setup Warning
Setting items on this menu to incorrect values may cause your system to malfunction
COM/LPT Configuration
PCI Configuration
Installed O/S: [Other]
Reset Configuration Data: [No]
Floppy disk controller: [Enabled]
Local Bus IDE adapter: [Both]
Large Disk Access Mode: [DOS]
Memory Gap at 15 Mbyte: [Disabled]
Video Adapter Settings
Item Specific Help
Select the operating system installed on your system which you will use most commonly.
Note: An incorrect setting can cause some operating systems to display unexpected behavior.
F1 Help
ESC Exit
Select Item
Select Menu
+ / – Change Values
Enter Select ▸ Sub-Menu
F9 Setup Defaults
F10 Save and Exit

Figure 5-9 “Advanced” Menu

Settings of the Advanced menu

Installed O/S	Plug and Play means that all modules are automatically detected and installed, providing they support the Plug and Play functionality. [other] BIOS handles the entire Plug and Play capability, default configuration [Win98] The operating system handles some of the Plug and Play functions	
Reset Configuration Data	[Yes] means that all previous Plug and Play are deleted. During the next system booting procedure the configuration will be started again. The entry is then reset to [No]. System components that do not support Plug and Play have to be entered manually.	
Floppy disk controller	Enables or disables the floppy-disk controller on the motherboard.	
Local Bus IDE adapter	[Primary] [Secondary]	One IDE interface for max. two drives.
	[Both]	Two IDE interfaces for max. four drives.
	[Disabled]	No local IDE interface.

Large Disk Access Mode	[DOS]	The drive tables are adapted for DOS access operations in accordance with Enhanced IDE.
	[OTHER]	The tables are not adapted.
Memory Gap at 15 MByte	[Disabled]	The complete onboard RAM memory is available.
	[Enabled]	A 1MB area of the RAM above 15MB (Addresses F0 0000 – FF FFFF) can be used by ISA expansion cards.

Submenu“COM/LPT Configuration”

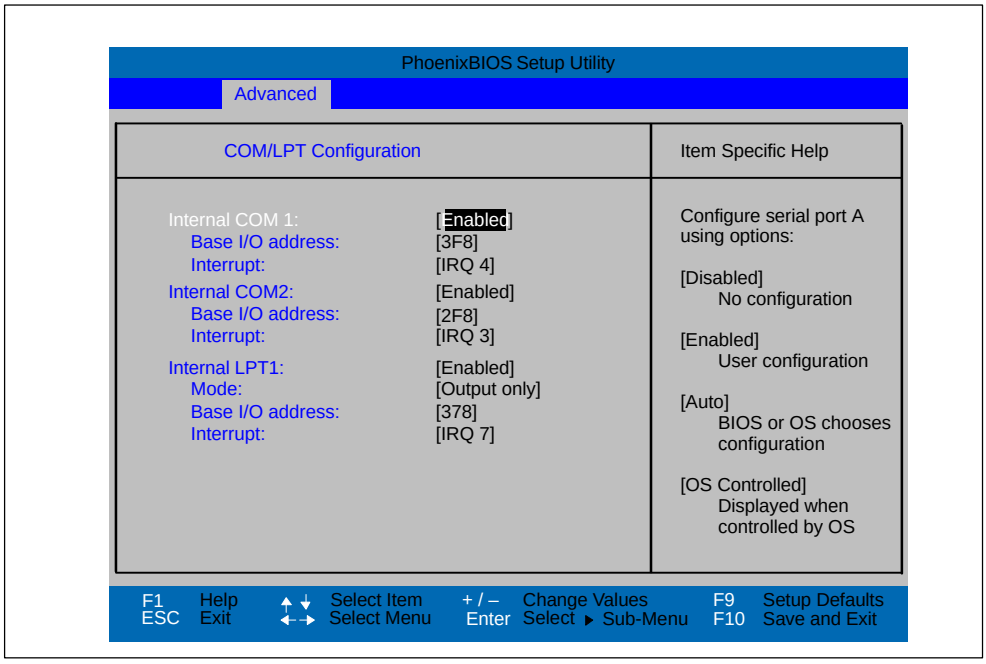

Figure 5-10 ”COM/LPT Configuration” Submenu

The resources used by an interface are released when you disable the interface in question.

The I/O addresses and interrupts are preassigned to be operated as COM1, COM2 and LPT1 and we recommend you use them accordingly.

Printer Port Internal LPT1

Mode:	Use this setting to set the operating mode of the printer interface. Refer to the table below to ensure that the setting matches the printer connected to the printer port.

Settable Mode	Features
Output Only Standard parallel port – unidirectional (SPP)	• Standard setting for the 8 bit parallel transfer according to IEEE1284 specifications • Feedback of the output device is only possible via the control cables
Bidirectional Standard parallel port – bidirectional	as for SPP – unidirectional, however: • Feedback of the output device is also possible via the 8 bit data cables
EPP Enhanced parallel port	• Enhanced parallel port (data transfer rate from 500kbps up to 2Mbps) • Hardware handshake • different devices can be addressed
ECP Extended capability port	as for EPP, however: • own DMA channel • FIFO backup • Data compression

PCI Configuration Submenu

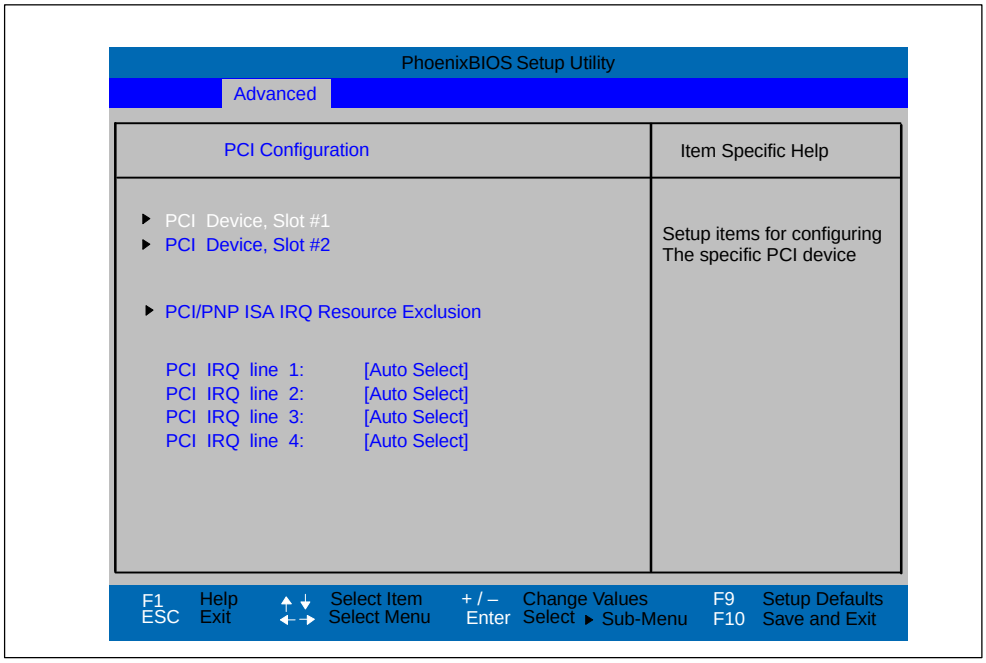

Figure 5-11 ”PCI Configuration” Submenu

”PCI Devices” Submenu

If the PCI devices field is selected, the following submenu appears:

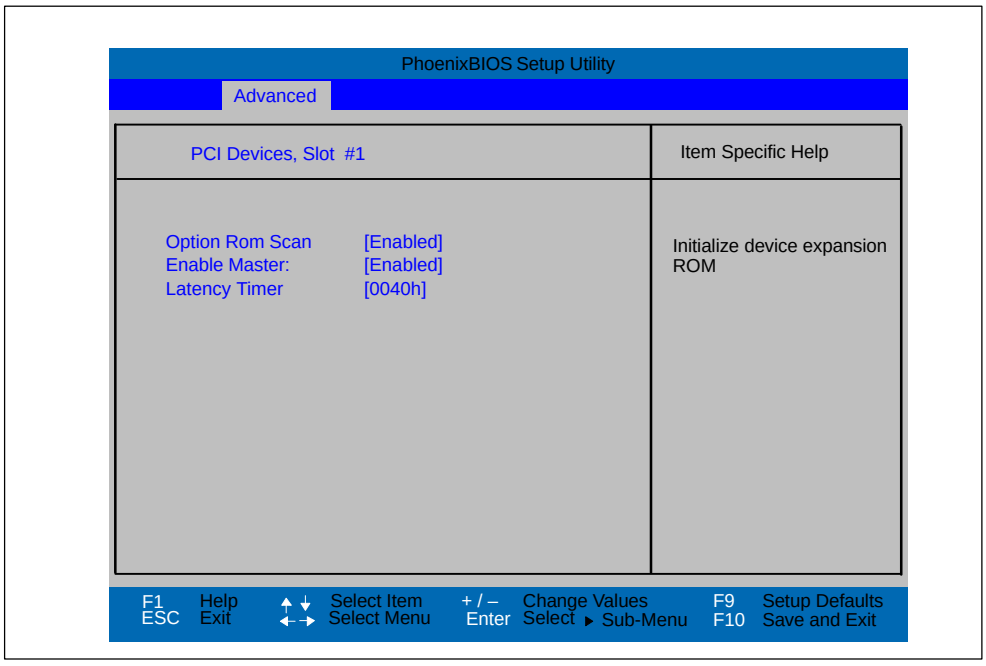

Figure 5-12 ”PCI Devices, Slot #1” Submenu

Option ROM Scan:	[Enabled] [Disabled]	The option ROM of the PCI module (if present) is enabled The option ROM of a PCI module is disabled.
Enable Master:	[Enabled] [Disabled]	This slot can assume the PCI master function This slot can only operate as a PCI slave.
Latency Timer	[Default] [0020H 00E0H]	The number of active PCI clock cycles of the master modules are determined by the module With these settings, the maximum active PCI clock to is set to the selected values.

Submenu “PCI/PNP ISA IRQ Resource Exclusion”

“Available” means that the BIOS Plug and Plug device can assign IRQs to Plug and Play compatible modules or main board functions.

You should only change it “Reserved” if the specific interrupt is to be assigned to not Plug and Play compatible PCMCIA modules.

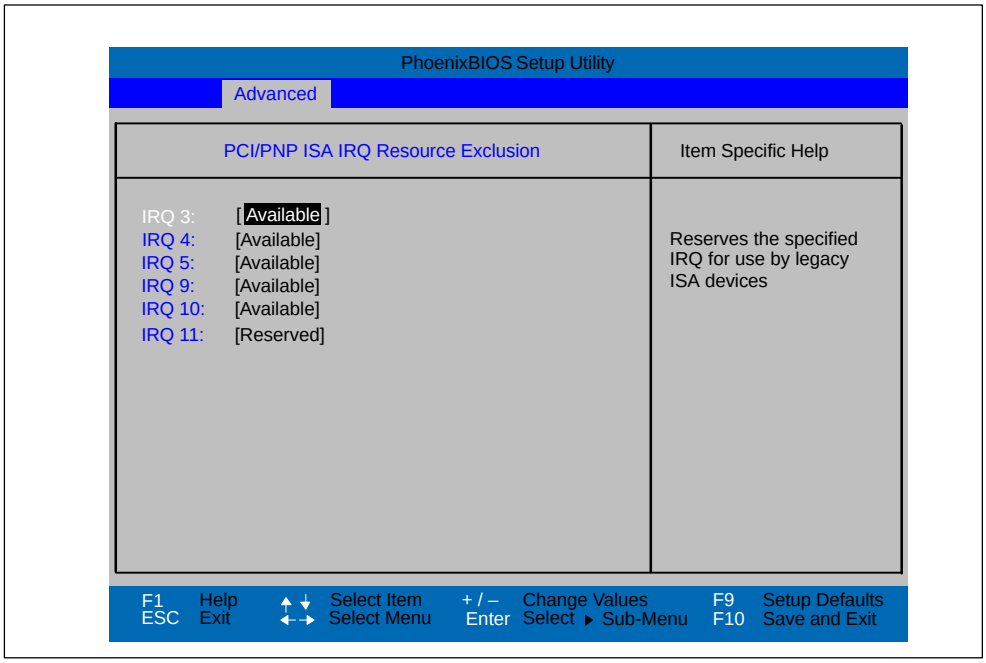
PhoenixBIOS Setup Utility
Advanced
PCI/PNP ISA IRQ Resource Exclusion
Item Specific Help
IRQ 3: [Available]
IRQ 4: [Available]
IRQ 5: [Available]
IRQ 9: [Available]
IRQ 10: [Available]
IRQ 11: [Reserved]
Reserves the specified IRQ for use by legacy ISA devices
F1 Help ↑↓ Select Item + / – Change Values F9 Setup Defaults
ESC Exit ←→ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

Figure 5-13 ”PCI / PNP ISA IRQ Resource Exclusion” Submenu

“PCI IRQ line” Field

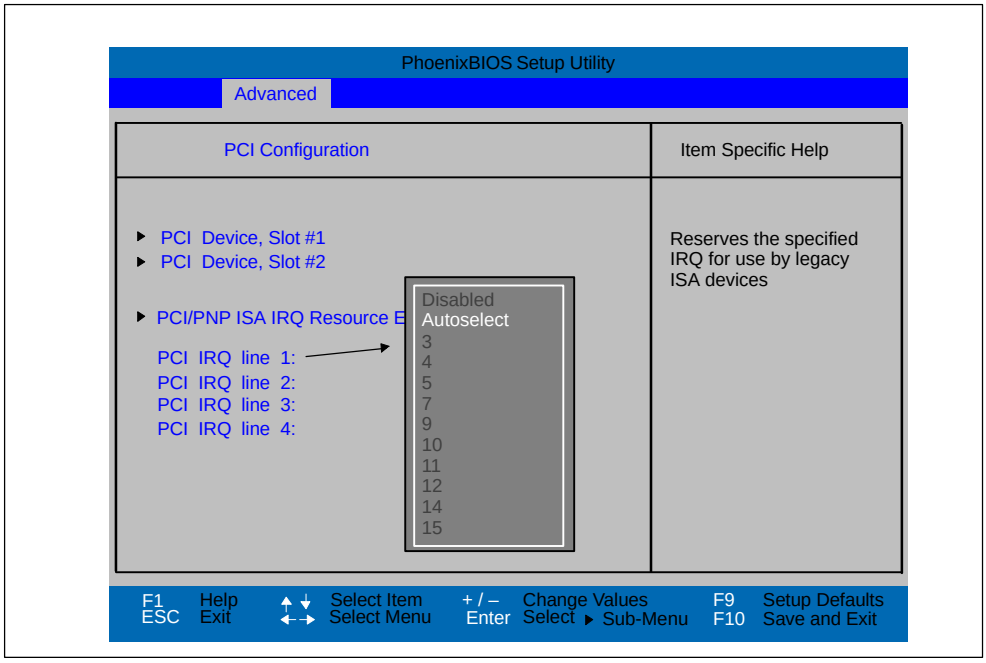

Figure 5-14 ”PCI Configuration” Submenu

Disabled	No interrupt possible for this PCI-IRQ line
AutoSelect	Plug and Play mechanism in BIOS selects unassigned interrupts and allocates them to the on-board PCI devices.
3 to 15	The PCI-IRQ line is assigned to the selected interrupt. Do not use this setting unless it is specifically required in your application’s documentation.

Submenu “Video Adapter Settings”

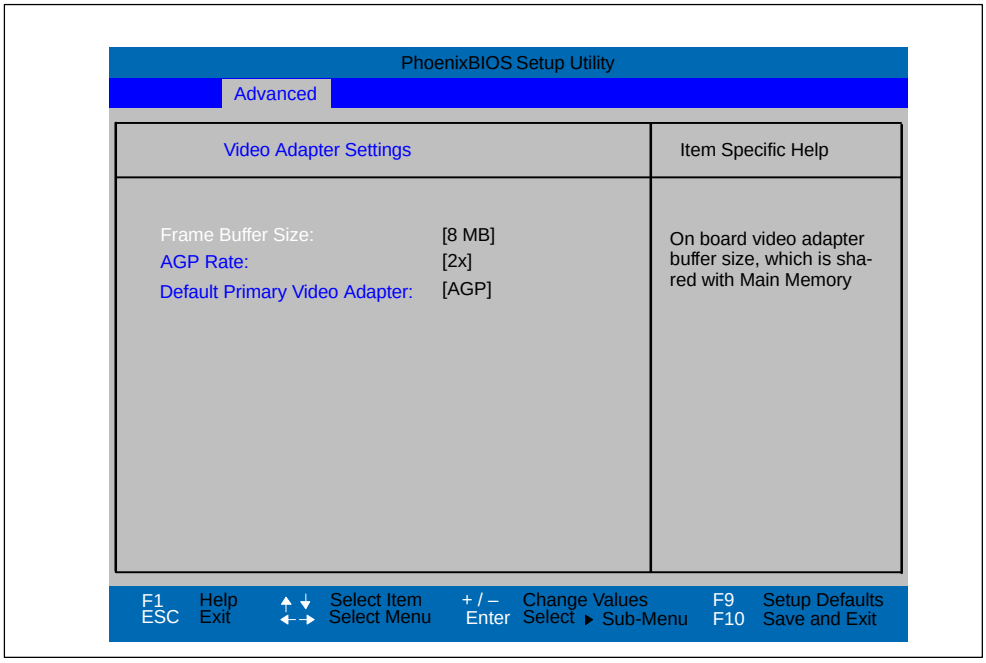

Figure 5-15 Submenu ”Video Adapter Settings”

Frame Buffer Size	[8] [16] [32]	Specifies the size of the graphic memory used Onboard graphic card. This range is in the Main memory of the system.
AGP Rate	[1x] [2x] [4x].	Specifies the AGP transfer speed to the Onboard graphic card
Default Primary Video Adapter	[AGP] [PCI]	The Onboard video graphic card is used as a primary display unit. A PCI graphic card may be used as a primary display device. This input is ignored if no additional graphic card is inserted.

5.1.3 Menü *Security*

Overview

You can only edit the fields enclosed in square brackets. In order to protect your computing unit against illegal use it is possible to enter two passwords. With the supervisor password, the setup access can be restricted or denied to normal users.

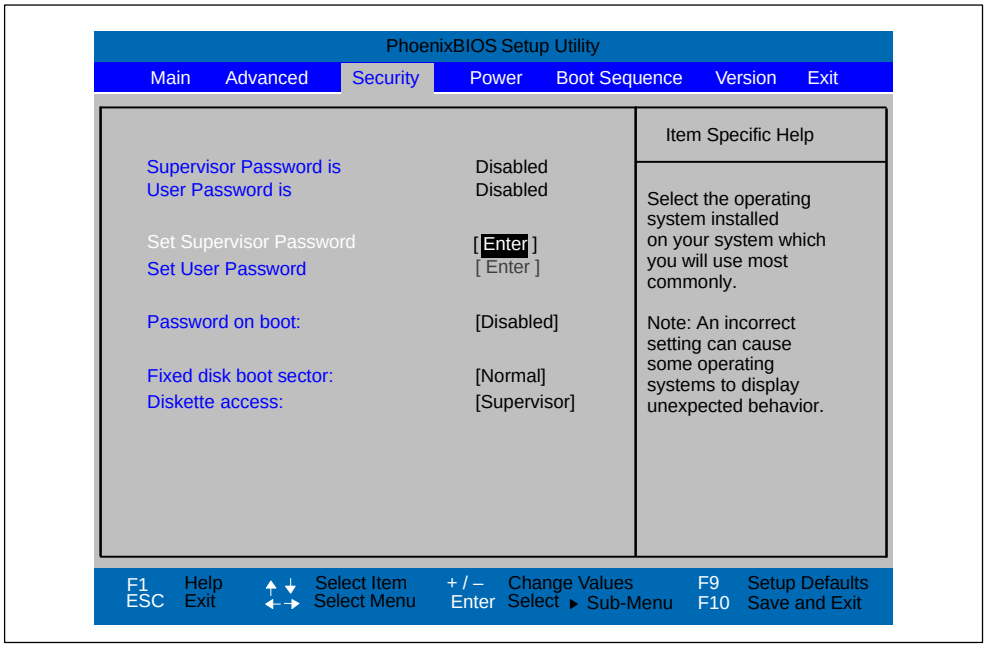
PhoenixBIOS Setup Utility
Main Advanced Security Power Boot Sequence Version Exit
Item Specific Help
Supervisor Password is Disabled
User Password is Disabled
Set Supervisor Password [Enter]
Set User Password [Enter]
Password on boot: [Disabled]
Fixed disk boot sector: [Normal]
Diskette access: [Supervisor]
Select the operating system installed on your system which you will use most commonly.
Note: An incorrect setting can cause some operating systems to display unexpected behavior.
F1 Help
ESC Exit
Select Item
Select Menu
+ / –
Enter
Change Values
Select ▸ Sub-Menu
F9 Setup Defaults
F10 Save and Exit

Figure 5-16 ”Security” Menu

Supervisor Password is	Disabled	Password not set. All setup entries can be processed without a password.
	Enabled	Passwort is enabled. The BIOS setup can only be processed after entering a password. This password has a higher priority than a User Password.
	The input field automatically changes from [Disabled] to [Enabled] when the password is entered.	
User Password is	Disabled	No User Password is assigned. If a Supervisor Password is assigned, only the Supervisor can operate the setup.
	Enabled	User Password is active. A user is thus given the right to process some setup fields.
	The input field automatically changes from [Disabled] to [Enabled] when the password is entered.	
Set User Password	This field opens the dialog box for entering a password. Once it has been entered correctly, the user password can be changed or deleted by pressing ”Return” and thus deactivated.	

Password on boot	[Disabled]	No password required for system boot.
	[Enabled]	Supervisor or user password must be entered for system boot.
Fixed disk boot Sector	[Normal]	All types of hard-disk access are permitted.
	[Write protect]	No operating system can be installed. This is a way of protecting against boot viruses.
Diskette access	This mode of protection is not active unless ”Password on boot ” is set to [enabled].	
	[Supervisor]	Diskette access is not possible unless the supervisor password was entered during system boot.
	[User]	Diskette access is not possible unless the user password was entered during system boot. **Note:** This function can not be used under Windows NT/2000, since this operating system does not access the diskette via BIOS routines. Please use the system programs in Windows NT/2000.

5.1.4 Menu *Power*

Overview

This menu has the following structure.

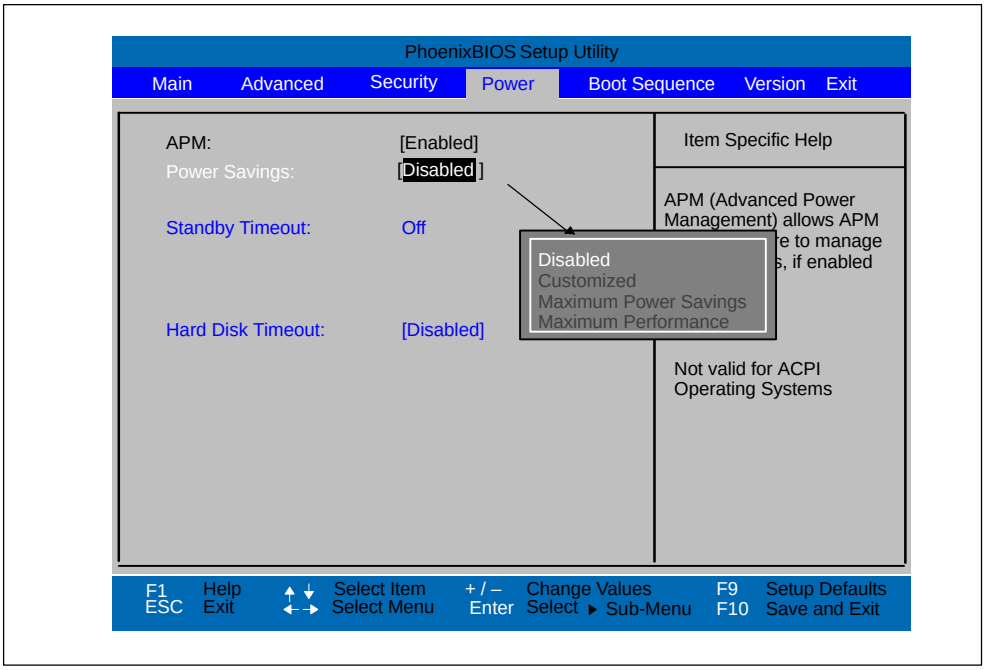

Figure 5-17 “Power” Menu

The Power menu offers a number of power saver modes for environmentally friendly computing:

APM (Advanced Power Management)	[Enabled] [Disabled]	The operating system can shut down system resources when they are not needed. The operating system is denied APM access.
Power Savings	[Disabled]	No power-saving functions
	[Customize, Maximum Power Savings, Maximum Performance]	freely adjustable power saving functions for maximum and minimum power saving functions. You can set the parameters for Standby/Suspend Timeouts and Fixed Disk Timeout or they set automatically to their defaults.
Standby Timeout	[Off]	No Standby mode
	[30 seconds or 1, 2, 4, 8, 12, 16]	...minutes after your PC enters standby mode.

Hard Disk Timeout	[Disabled] [10, 15, 30, 60]	The hard disk does not shut down. Time since the last hard-disk access, the hard disk is shut down. On the next access the hard disk will be activated again with a short delay.

5.1.5 Menu *Boot-Sequence*

Overview

This menu lists the boot devices in prioritized groups.

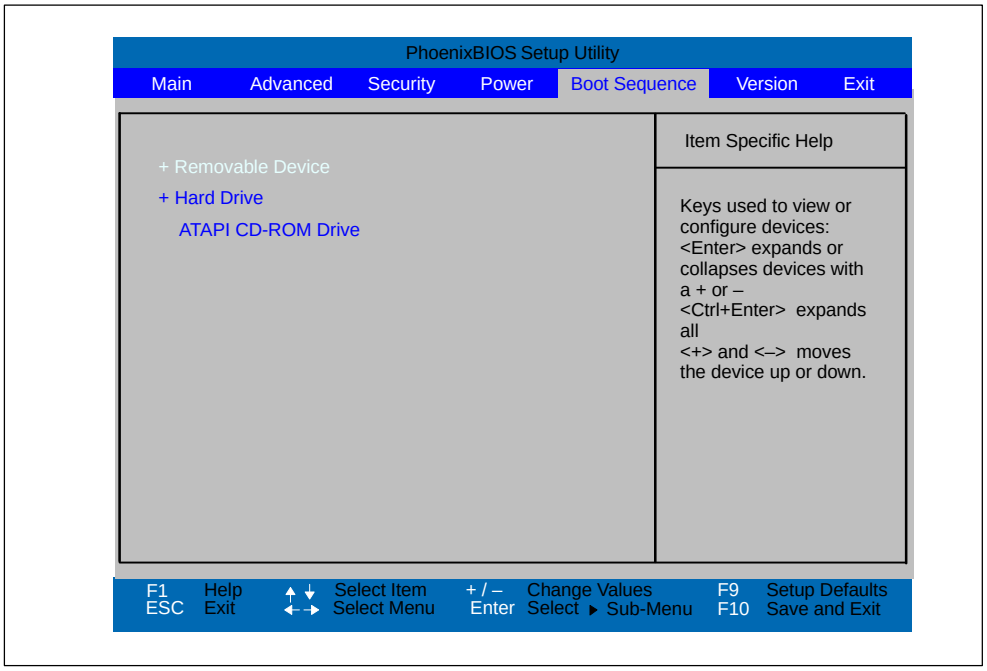

Figure 5-18 “Boot Sequence” Menu

This menu lists the boot devices in groups. The group with the highest priority is at the top. The procedure for changing the sequence is as follows:

Use the ↑↓ keys to select a group and the + or – keys to move the group to its new position in the sequence.

Note

During booting the boot drive can be selected with the ESC key.

Groups marked + contain more than one device. When you select a group marked in this way, hit Enter to view the list of devices in the group. See the figure below for an illustration:

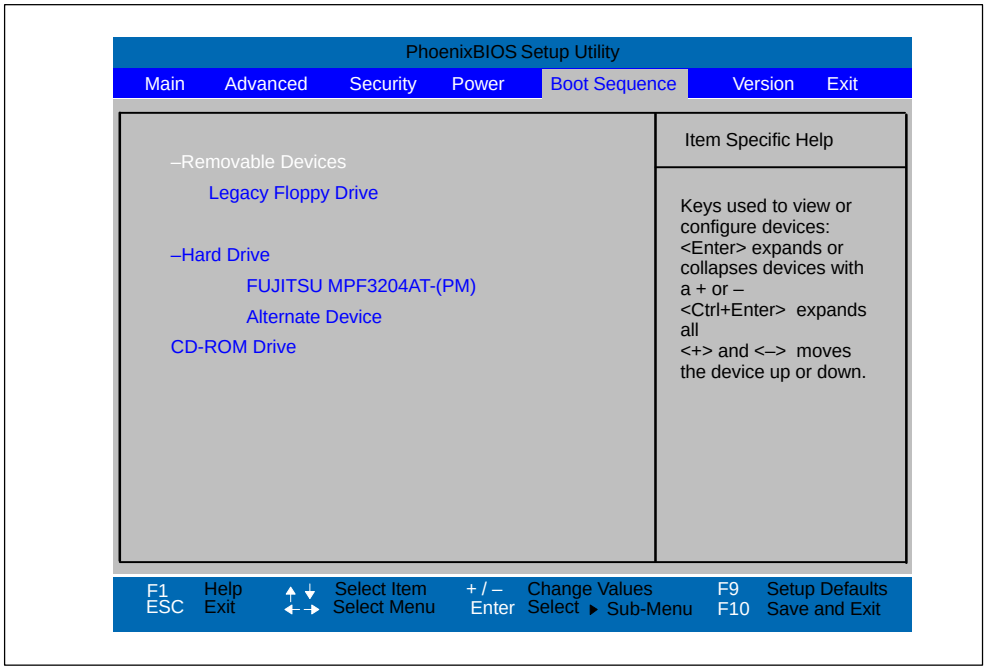

Figure 5-19 “Boot Sequence” Menu (Example)

This screen shows all possible boot devices; within a given group the highest priority device is always listed first. Here again, you can change the sequence as described above.

If a boot device is not available, the next device in the sequence is automatically checked to ascertain whether it is bootable.

5.1.6 Menu *Version*

This menu contains the information you will have to quote when you send us technical questions about your system.

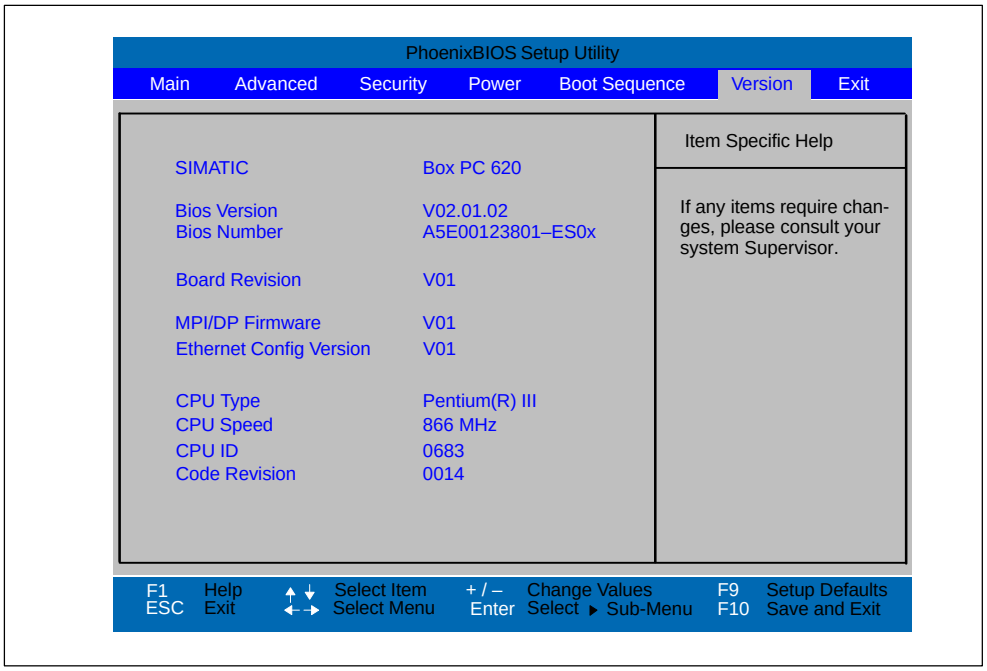

Figure 5-20 “Version” Menu

5.1.7 Menu *Exit*

The Exit Menu

The setup program is always terminated using this menu.

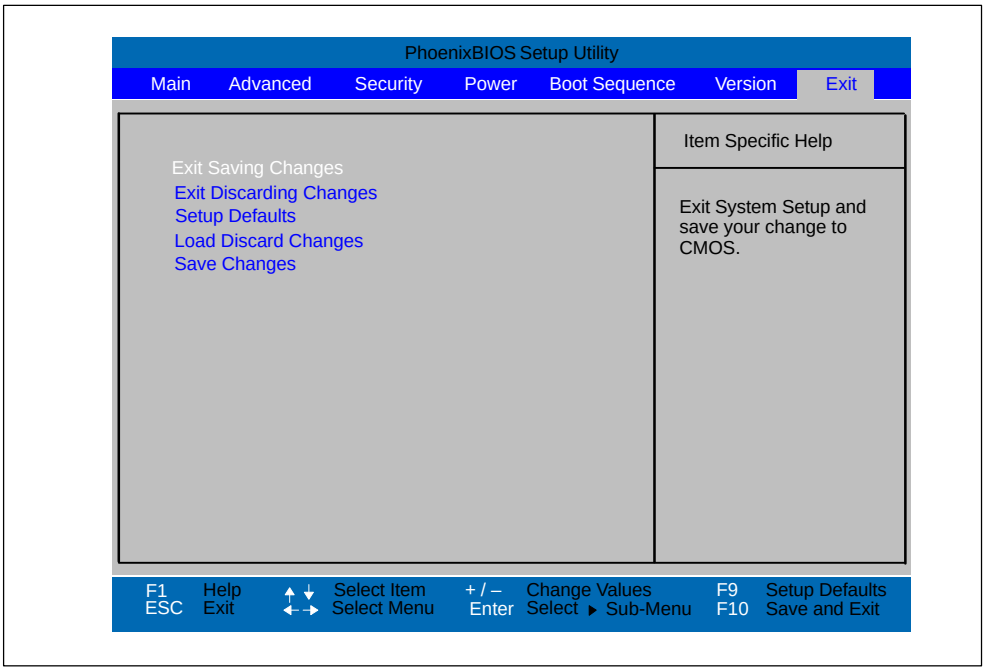

Figure 5-21 Menu “Exit”

Save Changes & Exit	All changes are saved; a system restart is carried out with the new parameters.
Discard Changes & Exit	All changes are rejected; a system restart is carried out with the old parameters.
Get Default Values	All parameters are set to safe values.
Load Previous Values	The last saved values are reloaded.
Save Changes	Save all Setup settings.

5.1.8 Setup default settings

Documenting your device configuration

If you have made any modifications to the default Setup settings, you can enter them in the following table. You can then refer to these entries if you need to make any hardware modifications later.

Note

Print the following table out and keep the pages in a safe place once you have filled in your entries.

System Parameters	Standard Settings	Your Entries
Main		
System Time	hh:mm:ss	
System Date	MM/DD/YYYY	
Disk A:	1,44 MB, 3 1/2” bei LS 240: Disabled	
Primary Master	C: 20496 MB	
Primary Slave	None	
Secondary Master	CD-ROM drive	
Secondary Slave	None	
Memory Cache	Write back	
Boot Options		
Quick Boot Mode	Enabled	
SETUP prompt	Enabled	
POST Errors	Enabled	
Floppy check	Disabled	
Summary screen	Enabled	
Keyboard Features		
Num Lock	On	
Key Click	Disabled	
Keyboard auto-repeat rate:	30/s	
Keyboard auto-repeat delay	1/2s	
Hardware Options		
PCI-MPI/DP:	Enabled	
On Board Ethernet	Enabled	
Ethernet Address	08000624xxxx	
LAN remote boot	Disabled	

System Parameters	Standard Settings	Your Entries
Cardbus/PCMCIA Slot	Enabled	
SafeCard Functions	Enabled	
Legacy USB Support	Disabled	
CRT/LCD selection	SIMULTAN	
LCD Screensize	Expanded	
DSTN Contrast	154	
PS2 Mouse	Enabled	
Advanced		
COM/LPT Configuration		
Internal COM1	Enabled	
Base I/O address	3F8	
Interupt	IRQ4	
Internal COM2	Enabled	
Base I/O address	2F8	
Interrupt	IRQ3	
Internal LPT1	Enabled	
Mode	Bi-directional	
Base I/O address	378	
Interrupt	IRQ7	
DMA Channel (only for ECP)	DMA 3	
PCI Configuration		
PCI Device Slot 1		
Option ROM Scan	Enabled	
Enable Master	Enabled	
Latency Timer	0040 h	
PCI Device Slot 2		
Option ROM Scan	Enabled	
Enable Master	Enabled	
Latency Timer	0040 h	
PCI/PnP ISA IRQ Exclusuion		
IRQ3	Available	
IRQ4	Available	
IRQ5	Available	
IRQ9	Available	
IRQ10	Available	
IRQ11	Reserved	
PCI IRQ Line 1	Auto Select	
PCI IRQ Line 2	Auto Select	
PCI IRQ Line 3	Auto Select	
PCI IRQ Line 4	Auto Select	
Installed O/S	Other	
Reset Configuration Data	No	

System Parameters	Standard Settings	Your Entries
Floppy disk controller	Enabled	
Local Bus IDE adapter	Both	
Large Disk Access Mode	DOS	
Hard Disk Pre-Delay	Disabled	
Memory Gap at 15 MByte	Disabled	
Video Adapter Settings		
Frame Buffer Size	8 MB	
AGP Rate	2x	
Default Primary Video Adapter	AGP	
Security		
Supervisor Password Is	Disabled	
User Password Is	Disabled	
Set Supervisor Password	F0 5A	
Set User Password	F0 5A	
Password on boot	Disabled	
Fixed disk boot sector	Normal	
Diskette Access	Supervisor	
Power		
APM	Enabled	
Power Savings	Disabled	
Standby Timeout	Off	
Hard Disk Timeout	Disabled	
Fan Control	Enabled	
Boot Sequence		
Diskette Drive		
Removable Devices		
Hard Drive		
ATAPI CD-ROM Drive		
Version		
SIMATIC	Box PC 620	
BIOS Version	V7.xx	
Board Revision	V01	
BIOS Number	A5E16562-ESxx	
MPI/DP Firmware	V01	
Ethernet Config Version	V01	
CPU Type	Pentium III	
CPU Speed	1,2 GHz	
Code Revision	001A	

5.2 Configure PC-Card interface

You can obtain the software you require for using PC cards under MS DOS, such as

- Socket Services
- Card Services
- Client Drivers
- Flash File System

can be obtained from the nearest Siemens sales office or representative.

Your PC comes supplied with Windows 98 / NT4 / 2000 already installed; this supports the PC Card interface.

After completing the configuration the computing unit has to be booted.

Fault Diagnosis

6

Chapter overview

This chapter provides information on localizing problems which frequently occur and how to clear them.

Note

Please refer to the operating system documentation with regard to error messages concerning the operating system.

In Section	You Will Find	on Page
6.1	Problems Using External Modules	6-2
6.2	External Screen Remains Dark	6-3
6.3	Display on the External Screen Does Not Appear or Scrolls	6-4
6.4	No Mouse Pointer Appears on the Screen	6-4
6.5	Computing Unit Time and/or Date are Not Correct	6-5
6.6	USB Device Does Not Work	6-5
6.7	Error Message Appears on the Screen/Display	6-6
6.8	Computing Unit Self Test Prior to Booting	6-8

6.1 Problems Using External Modules

Fault screen

Computing unit crashes during boot routine.

Cause

The following causes are possible:

- Double assignment of input/output addresses,
- Double assignment of hardware interrupts and/or DMA channels,
- Signal frequencies or signal levels are not maintained,
- Deviating assignment of the connector

Remedy

Checking the computer configuration:

- If the computer configuration corresponds to state on delivery, please contact your technical service department.
- If the computer configuration has been modified, restore the state on delivery; to do this, remove the external modules and restart the computer:
  - If the computing unit crashes again, contact the technical service department.
  - If the fault no longer occurs, the external module used was the cause of the fault. Replace the module with a Siemens module or get advice from the supplier of the external module.

6.2 External Screen Remains Dark

Cause/Remedy

The following causes are possible:

Monitor is switched off

- Switch on the screen.

Screen has been dimmed

- Press any key on the keyboard.

Brightness control set to dark

- Set the screen brightness control lighter. Please refer to the monitor operating manual for more detailed information.

Power cable or monitor cable not connected

- Switch the monitor and computing unit off.
- Check that the power cable is properly connected to the monitor and to the computing unit or a grounded shockproof socket.
- Check that the monitor cable is properly connected to the computing unit and monitor (where a plug is available).
- Switch the monitor and computing unit on.

Note

If the monitor screen remains dark following these checks and corrective measures, contact the technical service department.

6.3 Display on the External Screen Does Not Appear or Scrolls

Cause/Remedy

The incorrect line frequency and/or resolution is set for the screen or the application program.

- Exit from the application program. If the fault continues to occur after terminating the program, switch the monitor off and then on again following a wait of at least 3 seconds.
- Adapt the entries for the screen in the *CONFIG.SYS* file accordingly (on the hard disk).
- Correct the settings for monitor/graphics in the application program.
- Select the correct monitor driver for the application program.

6.4 No Mouse Pointer Appears on the Screen/Display

Cause/Remedy

If no mouse pointer appears, it may be due to the following reasons:

Mouse driver not loaded

- Check whether the mouse driver has been properly installed and is available when the application program is started. Please refer to the mouse or application program manuals for detailed information on the mouse driver.

Mouse not connected

- Switch the computing unit off.
- Check that the mouse cable is properly connected to the computing unit. If an adapter or extension cable is used for the mouse cable, check the plug in connection.
- Turn your computing unit on.

Note

If the mouse pointer still does not appear following these checks and corrective measures, contact the technical service department.

6.5 Computing Unit Time and/or Date are Not Correct

Remedy

Correct the time and date in the Setup menu.

Press *F2* during the boot routine to call in the Setup menu (refer to Chapter 5).

Note

If the date and time remain incorrect after switching the unit off and on again, the battery is empty.

Information on changing the backup battery is available in Chapter 4.3.

6.6 USB Device Does Not Work

The USB interface is not detected by the operating system. It is only fully supported, at present, by Windows 98, Windows 2000 and Windows XP. In the case of Windows NT, only the connection of a USB keyboard and USB mouse are supported.

6.7 Error Message Appears on the Screen/Display

Error messages

The error messages issued by the system BIOS are listed below. Refer to the relevant program manuals in the case of error messages issued by the operating system or programs.

Press *F2* during the boot routine to call in the Setup menu (refer to Chapter 5).

Error message on screen	Significance/Advice
Address conflict	Plug and Play Problem Contact your technical service department.
Combination not supported	Plug and Play Problem Contact your technical service department.
IO device IRQ conflict	Plug and Play Problem Contact your technical service department.
Invalid System Configuration Data	Plug and Play Problem Set the RESET CONFIGURATION.DATA option in the Advanced Setup menu. Contact your technical service department.
Allocation Error for ...	Plug and Play Problem Please revert the last hardware modification. Contact your technical service department.
System battery is dead Replace and run SETUP	Battery on the CPU module is defect or empty. Contact your technical service department.
System CMOS checksum bad Run SETUP	Call in SETUP, define settings and store. If this message appears during each boot routine, contact your technical service department.
Incorrect Drive A type Run SETUP	Check the SETUP entries for drive A.
Incorrect Drive B type Run SETUP	Check the SETUP entries for drive B.
Diskette drive A error	Fault accessing drive A Contact your technical service department.
Diskette drive B error	Fault accessing drive B. Contact your technical service department.
Failure Fixed Disk	Fault accessing the hard disk. Check the SETUP settings Contact your technical service department.
Keyboard error	Check that the keyboard is connected correctly.
Stuck Key	Check whether a key on the keyboard is jammed.
System RAM Failed at offset:	Memory error Contact your technical service department.
Shadow RAM Failed at offset:	Memory error Contact your technical service department.
Extended RAM Failed at offset:	Memory error Contact your technical service department.
Failing Bits:	Memory error Contact your technical service department.

Error message on screen	Significance/Advice
Operating system not found	Possible causes: No operating system available Wrong drive triggered (disk in drive A/B) Wrong active boot partition Wrong drive entries in SETUP
Previous boot incomplete Default configuration used	Termination of the previous boot routine, e.g. through power failure. Correct entries in SETUP.
System cache error Cache disabled	Fault in the cache module of the CPU module Contact your technical service department.
Monitor type does not match CMOS Run SETUP	Monitor does not match the SETUP entries. Adapt the SETUP entries on the monitor.
System timer error	Hardware error Contact your technical service department.
Real time clock error	Clock module fault Contact your technical service department.
Keyboard controller error	Keyboard error Contact your technical service department.

6.8 Computing Unit Self-Test Prior to Booting

After switching on the SIMATIC PC a self-test is initiated (POST = Power On Self Test). If errors are detected during the POST, the corresponding sequence of POST beeps (beep code) are issued. Each beep code consists of 2 x 2 sequences.

In addition, the individual test steps which the self-test executes, are issued on the I/O port 80h.

Conversion table for the beep codes to hexadecimal representation:

Beeps		Hex Code
B	B	0
B	BB	1
B	BBB	2
B	BBBB	3
BB	B	4
BB	BB	5
BB	BBB	6
BB	BBBB	7
BBB	B	8
BBB	BB	9
BBB	BBB	A
BBB	BBBB	B
BBBB	B	C
BBBB	BB	D
BBBB	BBB	E
BBBB	BBBB	F

Example

B	BBB	BBB	B	Beeps
2		8		Hex Code
Test system memory				Meaning

Special codes

In addition to the beep codes listed below, there are also special codes:

3x short	INSERT button has been pressed during the system start: The Onboard Device Installation is skipped. The Onboard Graphic is used as the standard output.
1x long 8x short	Fault reading the MPI system information: Contact your technical service department.
4x short	MPI EPROM was programmed for the first time.
1x long 5x short	Ethernet error: Contact your technical service department.

POST codes

The POST codes in order of occurrence:

Display (hex)	Meaning	Description
02	TP_VERIFY_REAL	Test whether the CPU is in real mode
1C	TP_RESET_PIC	Reset the interrupt controller
12	TP_RESTORE_CRO	Restore the controller register
13	TP_PCI_BM_RESET	Reset the PCI bus master
36	TP_CHK_SUTDOWN	Check the shutdown code
24	TP_SET_HUGE_ES	Switch the ES to special mode
03	TP_DISABLE_NMI	Switch off the NMI
0A	TP_CPU_INIT	Early initialization of the CPU
04	TP_GET_CPU_TYPE	Determine the CPU type
AE	TP_CLEAR_BOOT	Edit the boot flag
06	TP_HW_INIT	Initialize the main hardware
18	TP_TIMER_INIT	Initialize the timer
08	TP_CS_INIT	Initialize the chip set
C4	TP_PEM_SIZER_INIT	Reset system error
0E	TP_IO_INIT	Initialize IO
0C	TP_CACHE_INIT	Initialize the cache
16	TP_CHECKSUM	EPROM checksum test
28	TP_SIZE_RAM	Determine the RAM size
3A	TP_CACHE_AUTO	Determine the cache size
2A	TP_ZERO_BASE	Set 512k base RAM to 0
2C	TP_ADDR_TEST	Test the base RAM address cables
2E	TP_BASERAML	Basis RAM, check 1st 64k
0A	TP_CPU_INIT	Initialize the CPU
38	TP_SYS_SHADOW	BIOS shadow
0B	TP_CPU_CACHE_ON	Switch on the cache
0F	TP_FDISK_INIT	Initialize the hard disk
10	TP_PM_INIT	Initialize the power management
14	TP_8742_INIT	Initialize module 8742
1A	TP_DMA_INIT	Initialize the DMA modules
1C	TP_RESET_PIC	Reset the interrupt controller
32	TP_COMPUTE_SPEED	Determine the clock pulse speed
C1	TP_740_INIT	Initialize the PG 740 I/Os
34	TP_CMOS_TEST	Test the CMOS RAM
3C	TP_ADV_CS_CONFIG	Configure the advanced chip set
42	TP_VECTOR_INIT	Initialize the interrupt vectors

Display (hex)	Meaning	Description
46	TP_COPYRIGHT	Test the copyright
49	TP_PCI_INIT	Initialize the PCI interface
48	TP_CONFIG	Check the configuration
4A	TP_VIDEO	Initialize the video interface
4C	TP_VID_SHADOW	Copy the video BIOS to RAM
24	TP_SET_HUGE_ES	Switch the ES to special mode
22	TP_8742_TEST	Test module 8742
52	TP_KB_TEST	Keyboard available?
54	TP_KEY_CLICK	Switch the keyboard click on/off
76	TP_KEYBOARD	Check the keyboard
58	TP_HOT_INT	Test for unexpected interrupts
4B	TP_QUIETBOOT_START	If necessary, disable any boot messages
4E	TP_CR_DISPLAY	Display the copyright notice
50	TP_CPU_DISPLAY	Display the CPU type
5A	TP_DISPLAY_F2	Display the F2 message for ”SETUP”
5B	TP_CPU_CACHE_OFF	Switch off the cache if applicable (SETUP setting)
5C	TP_MEMORY_TEST	Test the system memory
60	TP_EXT_MEMORY	Test the extended memory
62	TP_EXT_ADDR	Test the A20 address line
64	TP_USERPATCH1	Area for own initializations
66	TP_CACHE_ADVNCD	Determine and enable the cache size
68	TP_CACHE_CONFIG	Configure and test the cache
6A	TP_DISP_CACHE	Display the cache configuration
6C	TP_DISP_SHADOWS	Configuration and size of the shadow Display RAM
6E	TP_DISP_NONDISP	Display non-disposable segment
70	TP_ERROR_MSGS	Display post error
72	TP_TEST_CONFIG	Check SETUP irregularities
7C	TP_HW_INTS	Set the IRQ vectors
7E	TP_COPROC	Check whether the CO processor is present
96	TP_CLEAR_HUGE_ES	Switch the ES back
80	TP_IO_BEFORE	Disable IO modules
88	TP_BIOS_INIT	Various initializations
8 A	TP_INIT_EXT_BDA	Initialize the external BIOS data area
85	TP_PCI_PCC	Determine the PCI modules

Display (hex)	Meaning	Description
82	TP_RS232	Determine the serial interfaces
84	TP_LPT	Determine the parallel interface
86	TP_IO_AFTER	Re-enable the IO modules
83	TP_FDISK_CFG_IDE_CTRLR	Configure the IDE controller
89	TP_ENABLE_NMI	Enable the NMI
8C	TP_FLOPPY	Initialize the floppy controller
90	TP_FDISK	Initialize the hard disk controller
8B	TP_MOUSE	Test the internal mouse interface
95	TP_CD	Test the CP
92	TP_USERPATCH2	Area for own initializations
98	TP_ROM_SCAN	Search for BIOS expansions
69	TP_PM_SETUP	Initialize the power management
9E	TP_IRQS	Enable the hardware IRQ
A0	TP_TIME_OF_DAY	Set the clock time and date
A2	TP_KEYLOCK_TEST	Preset the keylock
C2	TP_PEM_LOCK	Stop the error manager
C3	TP_PEM_DISPLAY	Display any possible errors
A8	TP_ERASE_F2	Delete the F2 message
AA	TP_SCAN_FOR_F2	Was F2 pressed?
AC	TP_SETUP_CHEK	If necessary, Switch F1/F2 message
AE	TP_CLEAR_BOOT	Cancel the self-test flag
B0	TP_ERROR_CHECK	Check for any possible errors
B2	TP_POST_DONE	End of the self-test
BE	TP_CLEAR_SCREEN	Clear the screen
B6	TP_PASSWORD	Password query (option)
BC	TP_PARITY	Cancel the parity flag
BD	TP_BOOT_MENU	Display the boot menu (option)
B9	TP_PREPARE_BOOT	Prepare the boot
C0	TP_INT19	Boot via Interrupt 19
00		Message after startup is complete

Hardware Information

7

Chapter Overview

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7.1 Power Consumption of the Components (Maximum Values)

Basic system

Component	Voltage				
	+5V	**+3.3V**	**+12V**	**–5V**	**–12V**
Pentium III Motherboard	0.5 A	2.5 A	0.1 A		0.02 A
Processor Pentium III 1260	5 A				
Floppy disk drive / LS 240	0.56 A				
Hard disk	0.4 A		0.5 A		
CD RW/DVD drive	0.92 A				
Fan			0.2 A		
Sum (max. for basic configuration)	**7.38 A**	**2.5 A**	**0.8 A**	**0 A**	**0.02 A**
ISA/PCI slots (Sum)	3 A	4 A	0.6 A	0.1 A	0.1 A
PC card slot	0.5 [1]	0.6 A [1]	0.12 A		
Sum (max. for maximum configuration)	**13.5 A**	**8.5 A**	**2.5 A** [2]	**0.1 A**	**0.3 A**
Total power consumption	**105W**				

1 Alternative 5V or 3.3V
2 3A, if the total power consumption is not exceeded

7.2 Overview of the Components and Interfaces

Component/ Port	Description	Parameters
Chipset	VIA PN133T	• SDRAM
BIOS	Update via software	• 512K in 4 pages
CPU	Pentium III / Celeron (type FC-PGA370)	• Upgradeable • Multimedia support • On Board L2-Cache with 128 k/256 k /512 K
Memory	DIMM modules up to max. 256MB/DIMM	• Data capacity of 64 bits + ECC • Modules with ECC possible • 3.3 V • SDRAM to PC100 specification • up to 128MBit chip size on the module • 66/100MHz bus speed • 2 DIMMs can be used • Easy to replace • variable from 64-512MB/DIMM
Graphics card	UXGA LCD Controller on the AG Bus is integrated Chip set (S3)	• up to 32 Mbytes of SDRAM are part of the main memory and can be configured (8/16/32MB) • CRT: up to1600x1200/85Hz 65536 colors with PC133 memory modules up to1280x1024/85Hz 65536 colors with PC100 memory modules
Hard disk	ATA-33 mode	• Ultra DMA capable
CD-ROM drive	Master on secondary EIDE channel	• 24 speed
CD-RW/DVD	Master on secondary EIDE channel	Multi Spin Writer Drive • Read: CD-ROM, CD-R 14-32 times, CD-RW 8-20 times Speed • Write: CD-R 12 times, CD-RW 10 times Speed suppors recording: • Disc at once, Track at once, Session at once, Packet writing
Floppy	Notebook port for 34-pin ribbon cable	• 1.44 MB
LS240	Slave on secondary EIDE channel	• 1.44 MB standard floppy disks • 120MB/240MB SuperDisk
Keyboard	Port for PS2 keyboard	• Standard
Mouse	PS2 mouse port	• Standard
Serial	COM1/25 pins COM2/9 pins.	• TTY *2 and V24 • Standard
TTY	Communication with SIMATIC S5-CPUs	• Range up to 1000 m

Component/ Port	Description	Parameters
Parallel	Standard, bidirectional, EPP and ECP modes	• 25 pin subminiature Cannon connector
DP12	Communication port SIMATIC S7	• potentially isolated DP12 *1 (CP 5611 compatible) • 12MBaud
USB	Universal Serial Bus	• three high current (500mA) USB ports (2x external and 1x internal)
Ethernet	10BaseT/100Base-TX (Intel 82559)	• 10/100 Mbps, potentially isolated *1

*1 Electrically isolated in a safety extra-low voltage circuit (SELV)

7.3 System Resources

All system resources (Hardware adresses, Memory allocation, Interrupt allocation, DMA channels) are dinamically assigned by the Windows operating system depending on the specific hardware, drivers and connected external devices. You can view the current configuration of system resources or possible conflicts with the following operating systems:

Windows 98

Start > Programs > Accessories > System Tools > System Information

Windows 2000

Start > Settings > Control Panel > Administrative Tools > Computer Management > System Information

Windows NT 4.0

Start > Programs > Administrative Tools (Common) > Windows NT Diagnostics

7.4 Monitoring Functions

The LEDs described in the following sections are only available on specific versions of the device. The basic configuration of the computing unit does not have any LEDs. The hardware signals are described in Section 7.5.2.

7.4.1 Overview

Function

The following individual functions are implemented:

- temperature monitoring and indication of overheating and underheating
- watchdog
- monitoring the processor fan

Messages can be passed by the monitor modules to applications.

The program SOM (Safecard On Motherboard) as well as drivers for Windows are available on the units for this. These tools can be used to display the status and assign parameters to limit values.

You will find a driver description of the SOM program for each specific operating system on the CD *Documentation and Drivers* in the directory \PC670.

7.4.2 Signals on the front interface

The meaning of the indicators is as follows:

LED	OFF	GREEN	RED
Run	Watchdog not active	Watchdog active	Watchdog executed
Temp	System turned off	Inside temperature normal	Inside temperature outside the permissible range.

7.4.3 Temperature monitoring/display

Temperature monitoring

The temperature is measured by means of three temperature sensors. One sensor monitors the processor temperature, the second the temperature in the area of the memory module and the expansion cards and the third the temperature in the area of the power supply unit.

- If the temperature near the power supply exceeds 45°C (fixed value), the fan is set to maximum rpms. To activate this feature, the setting “Fan Control” has to be turned on in the Setup menu (Sec. 6.1.4).
- If the temperature exceeds one of the three temperature values of the set thresholds, a temperature error is registered with the following effects:

Reaction	Options
Temp LED from GREEN to RED	Always
Fan goes to maximum rpms.	Always
Trigger IRQ	Adjustable

Temperature errors do not occur during the normal approved use of the device. If a temperature error occurs, check the following possible causes:

- Are the ventilation slots blocked?
- Is the fan working?
- Is the ambient temperature higher than the allowed value?
- Has the total capacity for the power supply been exceeded?

The temperature error remains saved until the temperature thresholds are again exceeded and are reset by one of the following measures:

- Acknowledge the error message via the SOM program
- Restarting the device.

7.4.4 Watchdog (WD)

Function

The watchdog monitors the execution of a program. The purpose of the WD is to report a program crashing to the user by means of different reactions.

After switching on the computing unit or after a HW-RESET (cold start) the watchdog remains in standby, i.e. no WD reaction is activated and the RUN-LED remains switched off. If the watchdog is activated (by driver or SOM program) the Run LED is green.

WD-Reaktionen

If the WD is not retriggered within the set time (by driver or SOM program), the following reactions are triggered:

Reaction	Options
RUN LED switches from green to red	Always
Acknowledge WD	Always
Initiate reset on the computing unit	Adjustable
IRQ an die Rechnereinheit absetzen	Adjustable
SOM application is displayed	Adjustable

The reactions you want to have triggered can be set by drivers or the SOM program.

WD monitoring times TWD

The monitoring times can be adjusted in increments of one second over the range from 3 to 255 seconds.

Note

If the watchdog time is modified after the watchdog has been activated – in other words, while the watchdog is running – the watchdog will be retriggered as a result!

7.4.5 Fan monitoring

The operation of the processor fan is monitored. If the fan should fail, the following reactions are triggered:

Reaction	Options
Temp LED from GREEN to RED	–
Trigger IRQ	Adjustable

The error remains saved until the cause of the failed fan is removed and the temperature error is reset by one of the following measures.

- Acknowledgement of the error message via the SOM program.
- Restarting the device.

7.5 Interfaces

The following interfaces are available on the computing unit's mainboard:

- ports for connecting external devices
- ports for connecting displays
- ports for internal connections (drives, wiring backplane, etc.)

The connector pin-outs of the different ports are described in the sections below.

7.5.1 External interfaces

Interface	Position	Connec-tor	Description
COM 1	external	X9	3F8h-3FFh, can be disabled IRQ4, edge-triggered 25-pin, socket, V.24/V.28 and 20mA (TTY isolated)
COM 2	external	X11	2F8h-2FFh, can be disabled IRQ3, edge-triggered 9-pin, standard connector
LPT1	external	X9	378h-37Fh, can be disabled IRQ7, edge-triggered 25-pin, standard socket
PS/2 mouse	external	X6	060h-064h IRQ12, edge-triggered 6-pin, mini DIN socket
PS/2 keyboard	external	X6	060h-064h IRQ1, edge-triggered 6-pin, mini DIN socket
USB	external	X40	First USB channel, additional internal second USB channel for front interface
MPI /DP12	external	X600	Can be disabled IRQ5, edge-triggered 9-pin, standard socket, isolated port
Ethernet	external	X500	RJ45
VGA	external	X11	3B0h-3BFh, 3C0h-3CFh, 3D0h-3DFh, can be disabled IRQ9, edge-triggered 15 pin, standard socket
PCCard/CardBus port	external	X700	3E0h-3E1h 100-pin SMD socket connector

Serial interface COM1 (AG/V24/Modem)

The serial interface (COM 1) of the computing unit is assigned as follows:

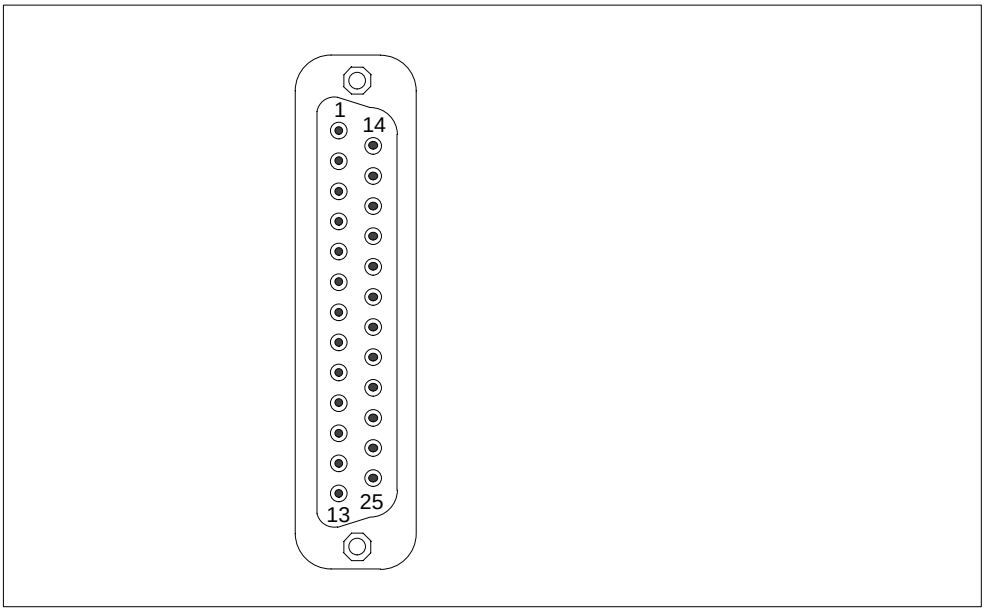


Figure 7-1 Serial interface COM1 (female)

Pin No.	Short Name	Meaning	Input/Output
1	-	Shield	-
2	TxD (D1)	Serial transmission data	Output
3	RxD (D2)	Serial received data	Input
4	RTS (S2)	Request to send	Output
5	CTS (M2)	Clear to send	Input
6	DSR (M1)	Data set ready	Input
7	GND (E2)	Functional ground (reference potential)	-
8	DCD (M5)	Data carrier detect (carrier)	Input
9	+TTY RxD	TTY receive	Input
10 - 17	-	Not assigned	-
18	+TTY TxD	TTY send	Output
19	+20mA	Isolated current source	-
20	DTR (S1)	Data terminal equipment ready	Output
21	-TTY TxD	TTY send	Output
22	RI (M3)	Incoming call	Input
23-25	-	Not assigned	-

Serial interface COM2 (V24/Mouse)

The serial interface (COM2) of the computing unit is assigned as follows

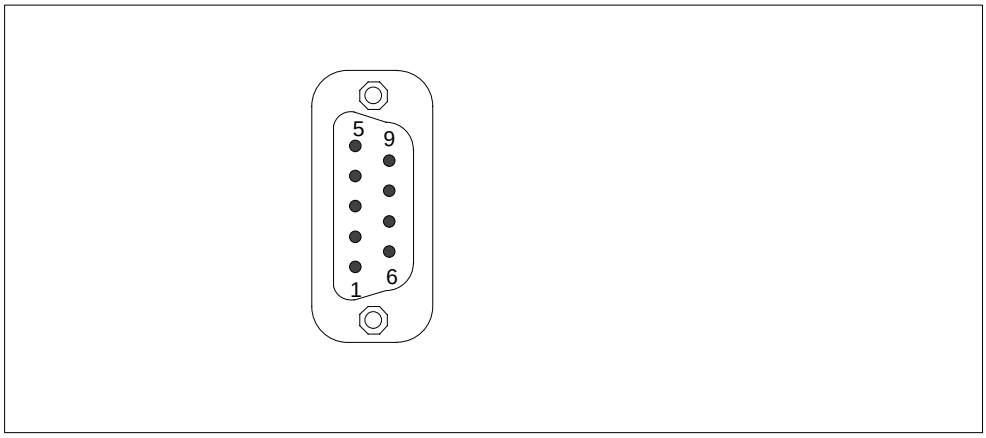


Figure 7-2 Serial interface COM2 (male)

Pin No.	Short Name	Meaning	Input/Output
1	DCD (M5)	Data carrier detect	Input
2	RxD (D2)	Received data	Input
3	TxD (D1)	Transmission data	Output
4	DTR (S1)	Data terminal equipment ready	Output
5	GND (E2)	Station ground	-
6	DSR (M1)	Data set ready	Input
7	RTS (S2)	Request to send	Output
8	CTS (M2)	Clear to send	Input
9	RI (M3)	Incoming call	Input

Parallel interface LPT1

The parallel interface (LPT1) of the computing unit is assigned as follows:

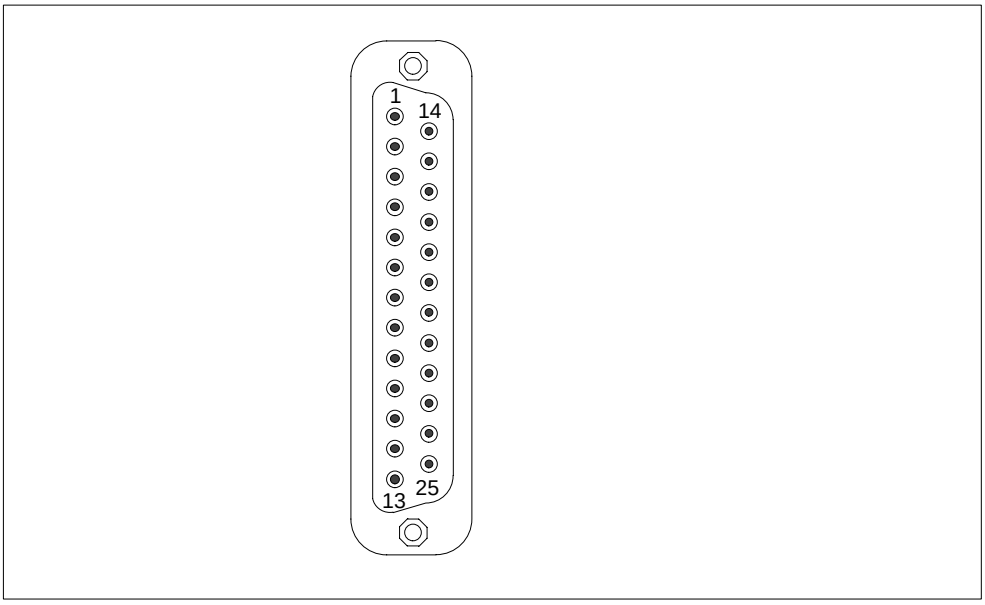
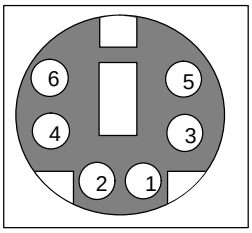


Figure 7-3 Parallel interface LPT1 (female)

Pin No.	Short Name	Meaning	Input/Output
1	/ Strobe (CLK)	Data message	Output (open collector)
2	Data bit 0	Data line 0	Output (TTL level)
3	Data bit 1	Data line 1	Output (TTL level)
4	Data bit 2	Data line 2	Output (TTL level)
5	Data bit 3	Data line 3	Output (TTL level)
6	Data bit 4	Data line 4	Output (TTL level)
7	Data bit 5	Data line 5	Output (TTL level)
8	Data bit 6	Data line 6	Output (TTL level)
9	Data bit 7	Data line 7	Output (TTL level)
10	/ACK	Acknowledge	Input (4.7 kΩ pull up)
11	BUSY	Not ready	Input (4.7 kΩ pull up)
12	PE (PAPER END)	No paper	Input (4.7 kΩ pull up)
13	SELECT	Device selection	Input (4.7 kΩ pull up)
14	/ AUTO FEED	Automatic new line	Output (open collector)
15	/ ERROR	Device error	Input (4.7 kΩ pull up)
16	/ INIT	Reset / Initialization	Output (open collector)
17	/ SELECT IN	Printer selection	Output (open collector)
18 - 25	GND	Chassis ground	-

PS/2 mouse interface

It is possible to connect a PS/2 mouse to the computing unit. The port is assigned as follows:



View of Socket

Figure 7-4 Connector Pinout for a PS/2 Mouse

Pin No.	Short Name	Meaning	Input/Output
1	DAT	Mouse data line	Input/Output
2	-	Not assigned	-
3	GND	Chassis ground	-
4	P5VFK	+5V (fused)	Output
5	CLK	Clock line, mouse	Input/Output
6	-	Not assigned	-

PS/2 trackball keyboard interface

It is possible to connect an external keyboard to the computing unit. The port is assigned as follows:

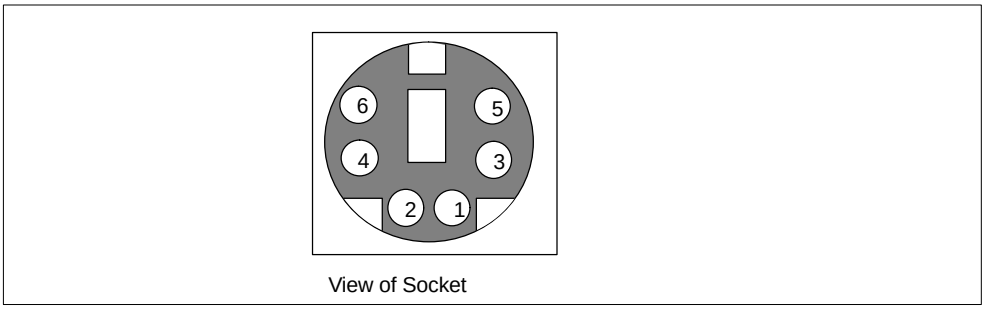


Figure 7-5 Connector Pinout for an External Keyboard Connecting Cable

Pin No.	Short Name	Meaning	Input/Output
1	DAT	Keyboard data	Input/Output
2	-	Not assigned	-
3	GND	Chassis ground	-
4	P5VFK	+5V (fused)	Output
5	CLK	Keyboard clock line	Input/Output
6	-	Not assigned	-

USB interface

The allocation of the Universal Serial Bus interfaces is as follows:

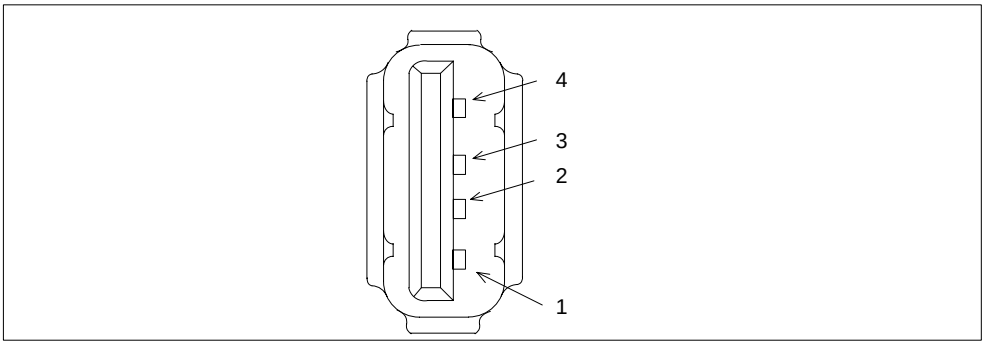


Figure 7-6 USB interface

Pin No.	Short Name	Meaning	Input/Output
1	VCC	+5V (fused)	Output
2	- Data	Data	Input/Output
3	+ Data	Data	Input/Output
4	GND	Chassis ground	-

The connector is of type A.

The port is rated as a high current USB (500mA).

MPI/DP interface

The MPI/DP port on the computing unit is assigned as follows:

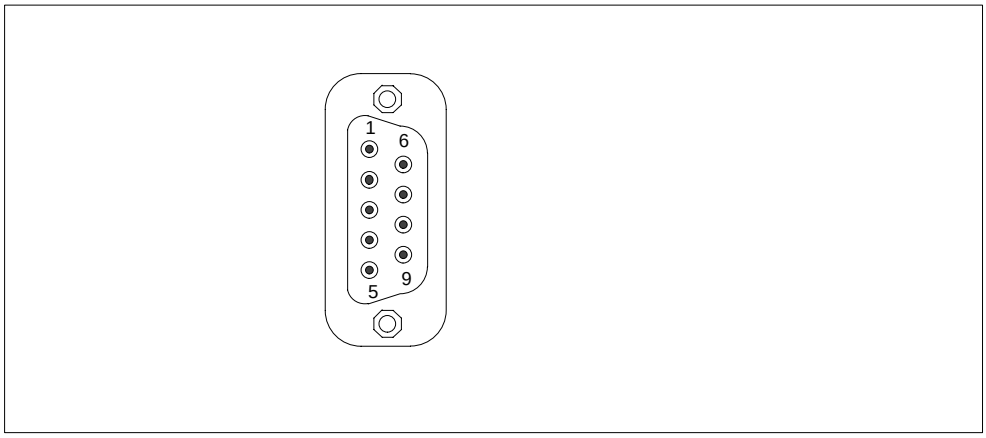


Figure 7-7 PROFIBUS/MPI Socket Connector

Pin No.	Short Name	Meaning	Input/Output
1	-	Not assigned	-
2	-	Not assigned	-
3	LTG_B	Signal lead B of MPI module	Input/Output
4	RTS_AS	RTSAS, control signal for received data stream. The signal is ’1’ active when the directly connected AS is sending.	Input
5	M5EXT	M5EXT return line (GND) of the 5 V power supply. The current load caused by an external user connected between P5EXT and M5EXT must not exceed 90 mA.	Output
6	P5 EXT	P5EXT supply (+5 V) of 5 V supply. The current load caused by an external user connected between P5EXT and M5EXT must not exceed 90 mA.	Output
7	-	Not assigned	-
8	LTG_A	Signal lead A of MPI module	Input/Output
9	RTS_PG	RTS output signal of the MPI module. The signal is ’1’ when the PG is sending.	Output
Shield		On connector casing	

Ethernet RJ45 connection

The Ethernet-RJ45 interface of the computing unit is assigned as follows:

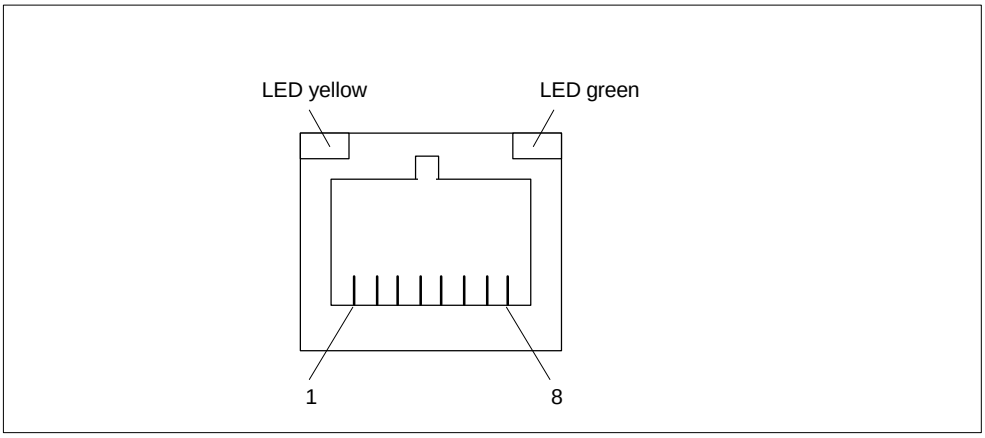


Figure 7-8 Ethernet port

Pin No.	Short Name	Meaning	Input/Output
1	TD+	Transmission data	Output
2	TD–	Transmission data	Output
3	RD+	Received data	Input
4, 5 *	SYMR	Internal 75 Ω output	-
6		Received data	Input
7, 8 *	SYMT	Internal 75 Ω output	-
S		Shield	-
	LED green	Connection	-
	LED yellow	Activity	-

* Not required for data transmission

VGA interface

The VGA socket on the computing unit is assigned as follows:

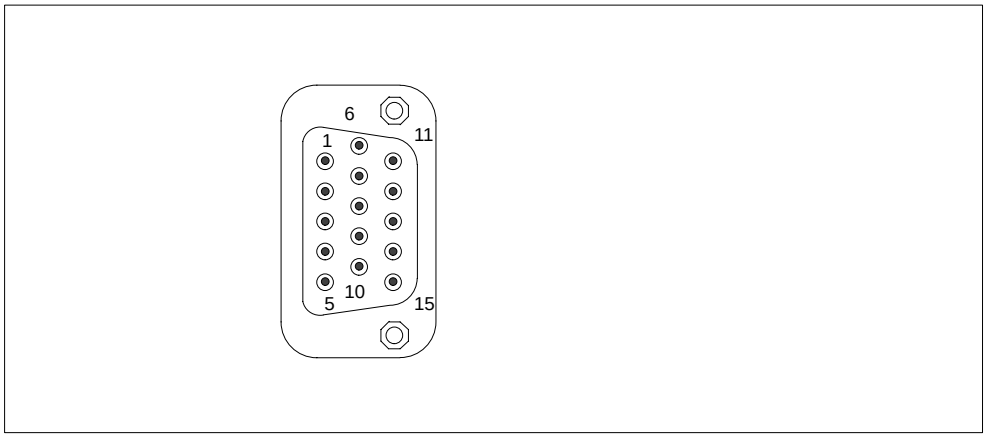


Figure 7-9 VGA Socket Connector

Pin No.	Short Name	Meaning	Input/ Output
1	R	red	Output
2	G	green	Output
3	B	Blue	Output
4	-	Not assigned	-
5	GND	Chassis ground	-
6	GND	Chassis ground	-
7	GND	Chassis ground	-
8	GND	Chassis ground	-
9	5 V	+5V (fused)	Output
10	GND	Chassis ground	-
11	-	Not assigned	-
12	DDC_DAT	Display Data Channel Data	Input/Output
13	EXT_H	Horizontal synchronizing pulse	Output
14	EXT_V	Vertical synchronizing pulse	Output
15	DDC_CLK	Display Data Channel Clock	Input/Output

7.5.2 Interface allocation for connecting a front on the main board

Interface	Position	Connector	Description
Display (CMOS)	Internal	X420	Connection of LC displays with CMOS port
Display (LVDS)	Internal	X400	Connection of LC displays with single chip LVDS port
I/O Front	Internal	X44	Port for front-panel I/O
COM 2	Internal	X26	Internal COM2 port

Display port (CMOS, X420)

D-STN and TFT displays with 5 V CMOS port and VGA resolution (640x480) can be connected to this port. The display is selected and the D-STN/TFT signals are allocated automatically according to the Display Select inputs. The maximum cable length is 50 cm at a display clock rate of 25 MHz.

Pin	Signal DSTN	Meaning DSTN	Pin	Signal TFT	Meaning TFT
1	P5V_D_fused	+5V (fused) Display VCC	1	P5V_D_fused	+5V (fused) Display VCC
2	P5V_D_fused	+5V (fused) Display VCC	2	P5V_D_fused	+5V (fused) Display VCC
3	GND		3	GND	
4	CLK	Shift clock	4	CLK	Shift clock
5	GND		5	GND	
6	LP	Horizontal sync	6	HSync	Horizontal sync
7	FP	Vertical sync	7	VSync	Vertical sync
8	-	-	8	R0	Signal red bit 0 (LSB)
9	-	-	9	R1	Signal red bit 1
10	UD6	Upper data bit 6	10	R2	Signal red bit 2
11	GND		11	GND	
12	UD7	Upper data bit 7	12	R3	Signal red bit 3
13	UD2	Upper data bit 2	13	R4	Signal red bit 4
14	UD3	Upper data bit 3	14	R5	Signal red bit 5 (MSB)
15	GND		15	GND	
16	UD1	Upper data bit 1	16	G0	Signal green bit 0 (LSB)
17	UD0	Upper data bit 0	17	G1	Signal green bit 1
18	LD3	Upper data bit 3	18	G2	Signal green bit 2
19	GND		19	GND	
20	LD2	Lower data bit 2	20	G3	Signal green bit 3
21	LD1	Lower data bit 1	21	G4	Signal green bit 4
22	LD0	Lower data bit 0	22	G5	Signal green bit 5 (MSB)
23	GND		23	GND	
24	UD5	Upper data bit 5	24	B0	Signal blue bit 0 (LSB)
25	UD4	Upper data bit 4	25	B1	Signal blue bit 1
26	LD7	Lower data bit 7	26	B2	Signal blue bit 2
27	GND		27	GND	
28	LD6	Lower data bit 6	28	B3	Signal blue bit 3
29	LD5	Lower data bit 5	29	B4	Signal blue bit 4
30	LD4	Lower data bit 4	30	B5	Signal blue bit 5 (MSB)
31	VCON	Contrast voltage	31	-	-
32	M	Data enable	32	ENAB	Data enable
33	DispOn	Display On	33	DispOn	Display On
34	Res.	Reserved	34	Res.	Reserved

Display port (LVDS), X400

TFT displays with an LVDS port can be connected to this port. 18-bit displays having a resolution up to 1024x768 pixels can be connected. The permissible display clock rate is 20 MHz to 66 MHz. The display is selected automatically according to the code of the Display Select inputs. The display supply voltages (3,3 V and 5 V) are connected as a function of the requirements for the connected displays via the graphics controller. The maximum cable length is 50 cm at a transfer rate of 455 MHz. Specific cable properties have to be taken into account for differential cable pairs in accordance with the LVDS specification.

Pin No.	Short Name	Meaning	Input/Output
1	P5V_D_fused	+5V (fused) Display VCC	Output
2	P5V_D_fused	+5V (fused) Display VCC	Output
3	RXIN0–	LVDS output signal bit 0 (-)	Output
4	RXIN0+	LVDS output signal bit 0 (+)	Output
5	P3V3_D_fused	+3.3V (fused) display VCC	Output
6	P3V3_D_fused	+3.3V (fused) display VCC	Output
7	RXIN1–	LVDS output signal bit 1 (-)	Output
8	RXIN1+	LVDS output signal bit 1 (+)	Output
9	GND	Chassis ground	-
10	GND	Chassis ground	-
11	RXIN2–	LVDS output signal bit 2 (-)	Output
12	RXIN2+	LVDS output signal bit 2 (+)	Output
13	GND	Chassis ground	-
14	GND	Chassis ground	-
15	RXCLKIN–	LVDS clock signal (–)	Output
16	RXCLKIN+	LVDS clock signal (+)	Output
17	GND	Chassis ground	-
18	GND	Chassis ground	-
19	Reserved		
20	Reserved		

Assignment of display to display select pins

Automatic configuration of one of 15 possible displays is performed by means of the Display Select inputs. The Display Select inputs have pull-up resistors – in other words, if these inputs are not connected, they go to High. The input has to be connected to GND for them to go Low.

Pin No.	LCD_SEL3	LCD_SEL2	LCD_SEL1	LCD_SEL0	Display type
0	Low	Low	Low	Low	reserved
1	Low	Low	Low	High	reserved
2	Low	Low	High	Low	reserved
3	Low	Low	High	High	reserved
4	Low	High	Low	Low	640 x 480 (VGA), TFT, 18 bit
5	Low	High	Low	High	reserved
6	Low	High	High	Low	1024 x 768 (XGA), TFT, 18 bit
7	Low	High	High	High	800 x 600 (SVGA), TFT, 18 bit
8	High	Low	Low	Low	reserved
9	High	Low	Low	High	reserved
10	High	Low	High	Low	reserved
11	High	Low	High	High	reserved
12	High	High	Low	Low	reserved
13	High	High	Low	High	reserved
14	High	High	High	Low	reserved
15	High	High	High	High	No display / DDC selected display

I/O interface for front control elements

All the signals necessary for the connection of front control elements, in addition to the display and USB ports, are applied to this port. The maximum cable length is 50 cm at a USB data rate of 12 Mbaud.

Pin No.	Short Name	Meaning	Input/Output
1	GND	Chassis ground	-
2	P12V	Power supply for inverter	Output
3	BL_ON	Backlight on (5V = On)	Output
4	P5V_fused	+5V (fused)	Output
5	GND	Chassis ground	-
6	P3V3_fused	+3.3V (fused)	Output
7	K_CLK	Keyboard clock	Output
8	K_DATA	Keyboard data	Input/Output
9	M_CLK	Mouse clock	Output
10	M_DATA	Mouse DATA	Input/Output
11	P5V_fused	+5V (fused)	Output
12	USB_D1M	USB data- channel 1	Input/Output
13	USB_D1P	USB Data+ port 1	Input/Output
14	GND	Chassis ground	-
15	LCD_SEL0	Display type select signal 0	Input
16	LCD_SEL1	Display type select signal 1	Input
17	LCD_SEL2	Display type select signal 2	Input
18	LCD_SEL3	Display type select signal 3	Input
19	RESET_N	Reset signal (Low active)	Input
20	SPEAKER	Connection for system speaker	Output
21	HD_LED	HD LED, anode with 1kΩ in series on motherboard	Output
22	DP_LED	MPI/DP LED, anode above 1kΩ in series on motherboard	Output
23	Ethernet_LED	Ethernet LED, anode above 1kΩ in series on motherboard	Output
24	TEMP_ERR	LED temperature error, anode with 1kΩ in series on motherboard	Output
25	RUN_R	LED watchDog error, anode with 1kΩ in series on motherboard	Output
26	RUN_G	LED watchdog o.k., anode with 1kΩ in series on motherboard	Output

Internal serial interface COM2 (V.24), X26

This port is connected in parallel to the external COM2 port. Both ports can therefore only be used as alternately. They are assigned such that a 1:1 connection can be established to a 9-pin D-SUB socket when insulation displacement connectors are used. The maximum cable length is 100 cm at a data rate of 9.6 kbaud.

Pin No.	Short Name	Meaning	Input/Output
1	DCD	Data carrier detect	Input
2	DSR	Data set ready	Input
3	RxD	Received data	Input
4	RTS	Request to send	Output
5	TxD	Transmission data	Output
6	CTS	Clear to send	Input
7	DTR	Data terminal equipment ready	Input
8	IP	Incoming call	Input
9	GND	Functional ground (reference potential)	-
10	P5V	+5V power supply	Output

7.5.3 Assignment of internal interfaces on the mainboard

Interface	Position	Connector	Description
Memory	Internal	X19, X20	2 SO-DIMM slot, 64Bit
Processor	Internal	X1	Socket for MMC2 mobile processor
Bus expansion	Internal	X10	Socket for bus extender, assigned with ISA and PCI bus signals
Power supply 105W	Internal	X13	20 pin connector for DC signals of the power supply unit with 85W
Floppy	Internal	X5	two drives are possible (82078 compatible) 360kB, 720kB, 1.2MB, 1.44MB 3F0h-3F7h, 370h-377h, can be disabled IRQ 6, edge-triggered 26 pin, socket for flex-lead (notebook connection)
3.5” hard disk	Internal	X41	170h-177h, 1F0h-1F7h, can be disabled IRQ14, IRQ15, edge-triggered 40 pin, 2.54mm male connector (3.5” HD, primary), a maximum of two drives can be connected

2.5” hard disks	Internal	X4	170h-177h, 1F0h-1F7h, can be disabled IRQ14, IRQ15, edge-triggered 44 pin, 2mm male connector (2.5” HD, primary), a maximum of two drives can be connected
CD-ROM drive	Internal	X3	170h-177h, 1F0h-1F7h, can be disabled IRQ14, IRQ15, edge-triggered 44 pin, 2mm male connector (CD ROM, secondary slave with connected LS120, otherwise secondary master), a maximum of one drive is operable
LS240	Internal	X31	170h-177h, 1F0h-1F7h, can be disabled IRQ14, IRQ15, edge-triggered 1x41 pin (Hirose DF9-41, LS240, secondary master with connected drive), a maximum of one drive is operable
TTY sender/receiver	Internal	X70/71	Connection for TTY transmitter/receiver hybrid (physical interface)
PS connection for 3.5” hard disk	Internal	X25	Power supply for 3.5” hard disk, 4 pin, male connector
PS connection for CPU fan	Internal	X29	Power supply for CPU fan, 3 pin, male connector
PS connection for device fan	Internal	X28	Power supply for device fan, 2 pin, male connector
Backup battery	Internal	X24	Power supply for device fan, 2 pin, male connector

Interface to wiring backplane

The computing unit has a wiring backplane with one PCI slot and one shared ISA/PCI slot. Expansion boards can be installed complying with ISA specification (Rev. 3.1) and PCI specification (Rev. 2.0) with a maximum length of 265mm (175 mm for shared ISA/PCI modules). All PCI slots can be used as masters. Only 5V PCI modules are operable.

The bus unit is executed as a purely passive module, i.e. there are only socket contacts for the expansion cards and any necessary backup capacitors. The power supply to the expansion cards is effected via the connection of the bus unit with the basic board. The -5V voltage is not provided for in the power supply and is produced from the -12V on the bus unit via in-phase voltage control.

DC interface of the power supply 105W

The power supply unit has a connector (X2) through which all the signals on the DC side are connected with the motherboard.

Pin No.	Short Name	Meaning
1	P5V	+5V
2	P5V	+5V
3	P5V	+5V
4	P5V	+5V
5	P5V	+5V
6	PS_NAU_N	Power failure, early warning signal
7	PS_PWROK	Power Good signal
8	GND	Chassis ground
9	GND	Chassis ground
10	GND	Chassis ground
11	N12V	–12V
12	GND	Chassis ground
13	GND	Chassis ground
14	GND	Chassis ground
15	P12V	+12V
16	P12V	+12V
17	P3V	+3.3V
18	P3V	+3.3V
19	P3V	+3.3V
20	P3V	+3.3V

Interface to floppy disk drive

By means of this interface a notebook floppy disk drive may be connected. The maximum connection length of the data cable may not exceed 40cm.

Pin No.	Short Name	Meaning	Input/ Output
1	P5V	+5V	Output
2	INDEX_N	Index hole recognition	Input
3	P5V	+5V	Output
4	DS_N0	Drive 0 selection	Output
5	P5V	+5V	Output
6	DCHG_N	Disk change display	Input
7	n.c.	Not assigned	-
8	n.c.	Not assigned	-
9	Reserved	Reserved	-
10	MOT_N0	Activate motor 0	Output
11	Reserved	Reserved	-
12	DIR_SL_N	Step motor direction	Output
13	n.c.	Not assigned	-
14	STEP_N	Step motor pulse	
15	GND	Chassis ground	-
16	WR_DAT_N	Write data signal	Output
17	GND	Chassis ground	-
18	WR_GAT_N	Enable data signal	Output
19	Reserved	Reserved	-
20	TRACK_N0	Track 0 signal	Input
21	Reserved	Reserved	-
22	WR_PRT_N	Write protection signal	Input
23	GND	Chassis ground	-
24	RD_DAT_N	Read Data signal	Input
25	GND	Chassis ground	-
26	SIDE_1_N	Page selection	Output

Allocation of IDE intefaces

The primary IDE port is designed for alternatively installing 2.5” and 3.5” hard disks. 3.5” drives are connected by means of a 40-pin 2.54 mm pitch connector and 2.5” drives by means of a 44-pin 2 mm pitch connector. The two connectors are connected in parallel. The secondary IDE port is intended for the optional connection of a CD ROM and / or an LS 240 drive. It can be adapted using a 44-pin 2 mm pitch connector. The maximum connection length of the data cables must not be longer than 40 cm.

Pin No.	X41	Meaning	Pin No.	X4/X3	Meaning
1	RESET	Reset	1	RESET	Reset
2	GND		2	GND	
3	D7	Data signal D7	3	D7	Data signal D7
4	D8	Data signal D8	4	D8	Data signal D8
5	D6	Data signal D6	5	D6	Data signal D6
6	D9	Data signal D9	6	D9	Data signal D9
7	D5	Data signal D5	7	D5	Data signal D5
8	D10	Data signal D10	8	D10	Data signal D10
9	D4	Data signal D4	9	D4	Data signal D4
10	D11	Data signal D11	10	D11	Data signal D11
11	D3	Data signal D3	11	D3	Data signal D3
12	D12	Data signal D12	12	D12	Data signal D12
13	D2	Data signal D2	13	D2	Data signal D2
14	D13	Data signal D13	14	D13	Data signal D13
15	D1	Data signal D1	15	D1	Data signal D1
16	D14	Data signal D14	16	D14	Data signal D14
17	D0	Data signal D0	17	D0	Data signal D0
18	D15	Data signal D15	18	D15	Data signal D15
19	GND		19	GND	
20	n.c.	Code	20	n.c.	Code
21	DREQ	DMA Request	21	DREQ	DMA Request
22	GND		22	GND	
23	IOW_N	IO Write	23	IOW_N	IO Write
24	GND		24	GND	
25	IOR_N	I/O read	25	IOR_N	I/O read
26	GND		26	GND	
27	IORDY	I/O ready	27	IORDY	I/O ready
28	Reserved		28	CSEL	Master/slave
29	DACK_N	DMA Acknowledge	29	DACK_N	DMA Acknowledge
30	GND		30	GND	
31	IOCS16	I/O Chip Select 16	31	IOCS16	I/O Chip Select 16
32	n.c.		32	n.c.	
33	AD_1	Address 1	33	AD_1	Address 1
34	Reserved	Reserved	34	reserved	Reserved
35	AD_0	Address 0	35	AD_0	Address 0
36	AD_2	Address 2	36	AD_2	Address 2
37	CS1_N	Chip Select 1	37	CS1_N	Chip Select 1
38	CS3_N	Chip Select 3	38	CS3_N	Chip Select 3
39	HDACT_N	HD active	39	HDACT_N	HD active
40	GND		40	GND	
			41	P5V	+5V power supply
			42	P5V	+5V power supply
			43	GND	
			44	reserved	Reserved

Connection of an LS240 drive

The optional LS240 drive is connected via this port. This port is connected in parallel to the secondary IDE port. The connected LS240 drive is automatically master (i.e. bootable drive) as the result of a special RC circuit. The maximum connection length of the data cable may not exceed 40cm.

Pin No.	Short Name	Meaning	Input/ Output
1	Reserved	Reserved	-
2	Reserved	Reserved	-
3	reserved	Reserved	-
4	GND	Chassis ground	-
5	RESET	Reset	Input/Output
6	D8	Data signal D8	Input/Output
7	D7	Data signal D7	Input/Output
8	D9	Data signal D9	Input/Output
9	D6	Data signal D6	Input/Output
10	D10	Data signal D10	Input/Output
11	D5	Data signal D5	Input/Output
12	D11	Data signal D11	Input/Output
13	D4	Data signal D4	Input/Output
14	D12	Data signal D12	Input/Output
15	D3	Data signal D3	Input/Output
16	D13	Data signal D13	Input/Output
17	D2	Data signal D2	Input/Output
18	D14	Data signal D14	Input/Output
19	D1	Data signal D1	Input/Output
20	D15	Data signal D15	Input/Output
21	D0	Data signal D0	Input/Output
22	DREQ	DMA request	Input
23	GND	Chassis ground	-
24	IOR_N	Read signal	Output
25	IOW_N	Write signal	Output
26	GND	Chassis ground	-
27	IORDY	Ready signal	Input
28	DACK_N	DMA confirmation	Output
29	irq15	Interrupt signal	Input
30	AD_1	Address line 1	Output
31	AD_0	Address line 0	Output
32	AD_2	Address line 2	Output
33	CS_N	Selection signal	Output
34	HDACT_N	Activity	Input
35	CS1_N	Selection signal 1	
36	CSEL	Selection signal	
37	GND	Chassis ground	-
38	P5V	+5V power supply	Output
39	P5V	+5V power supply	Output
40	P5V	+5V power supply	Output
41	P5V	+5V power supply	Output

SV connection for hard disk

The power supply of the 3.5” hard disk is effected via this connection.

Pin No.	Short Name	Description	Input / Output
1	P12V	+12 V	Output
2	GND	Chassis ground	–
3	GND	Chassis ground	–
4	P5V	+5 V	Output

Connection for CPU fan

The CPU fan is connected via this connection.

Pin No.	Short Name	Description	Input / Output
1	GND	Chassis ground	–
2	+12V	Switched power supply	Output
3	CPU FAN_CLK	Speed signal	Input

Connection for device fan

The device fan is connected via this connection.

Pin No.	Short Name	Description	Input / Output
1	+12V	Switched power supply	Output
2	GND	Chassis ground	–

Connection for buffer battery

The battery for the standby supply to the CMOS RAM is connected to this connection. The battery used is a 3.6 V lithium battery with a capacity of 750 mAh.

Pin No.	Short Name	Description	Input / Output
1	+12V	Switched power supply	Output
2	GND	Chassis ground	–

7.6 Wiring Backplane

7.6.1 Design and Theory of Operation

The bus board is designed as a passive link between the motherboard and the expansion modules. It is mounted with a screw.

The bus board has two ISA slots and two PCI slots, as well as a shared ISA /PCI slot. The power supply to the expansion cards is effected via the connection of the bus unit with the basic board. An external power supply (+5V and +12V) is provided.

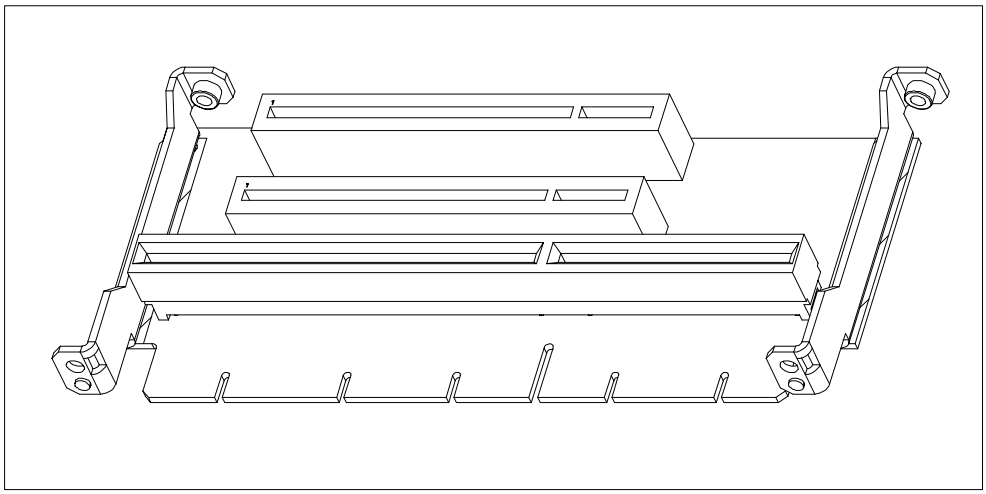


Figure 7-10 Wiring Backplane

7.6.2 Pin assignmentI SA slot

Pin No.	Short Name	Type*	Pin No.	Short Name	Type
A1	IOCHCK	I	B1	0 V	GND
A2	SD 07	I/O	B2	RESET DRV	O
A3	SD 06	I/O	B3	+ 5V	V_{CC}
A4	SD 05	I/O	B4	IRQ 9	I
A5	SD 04	I/O	B5	– 5V	V_{CC}
A6	SD 03	I/O	B6	Reserved	I
A7	SD 02	I/O	B7	– 12V	V_{CC}
A8	SD 01	I/O	B8	Reserved	I
A9	SD 00	I/O	B9	+ 12V	V_{CC}
A10	IOCHRDY	I	B10	0 V	GND
A11	AEN	O	B11	SMEMW#	O

Pin No.	Short Name	Type*	Pin No.	Short Name	Type
A12	SA 19	I/O	B12	SMEMR#	O
A13	SA 18	I/O	B13	IOW#	I/O
A14	SA 17	I/O	B14	IOR#	I/O
A15	SA 16	I/O	B15	DACK3#	O
A16	SA 15	I/O	B16	DRQ 3	I
A17	SA 14	I/O	B17	–ACK1#	O
A18	SA 13	I/O	B18	DRQ 1	I
A19	SA 12	I/O	B19	REFRESH#	I/O
A20	SA 11	I/O	B20	CLK	O
A21	SA 10	I/O	B21	IRQ 7	I
A22	SA 09	I/O	B22	Reserved	I
A23	SA 08	I/O	B23	IRQ 5	I
A24	SA 07	I/O	B24	IRQ 4	I
A25	SA 06	I/O	B25	IRQ 3	I
A26	SA 05	I/O	B26	reserved	O
A27	SA 04	I/O	B27	TC	O
A28	SA 03	I/O	B28	BALE	O
A29	SA 02	I/O	B29	+ 5V	V_{CC}
A30	SA 01	I/O	B30	OSC	O
A31	SA 00	I/O	B31	0 V	GND

*) I/O defines the direction of the signals from the point of view of the CPU module.

low active

Pin	Signal Name	Type *	Pin	Signal Name	Type
C1	–SBHE	O	D1	–MEMCS16	I
C2	LA 23	I/O	D2	–IOCS16	I
C3	LA 22	I/O	D3	IRQ 10	I
C4	LA 21	I/O	D4	IRQ 11	I
C5	LA 20	I/O	D5	IRQ 12	I
C6	LA 19	I/O	D6	IRQ 13	I
C7	LA 18	I/O	D7	IRQ 14	I
C8	LA 17	I/O	D8	–DACK0	O
C9	–MEMR	I/O	D9	DRQ 0	I
C10	–MEMW	I/O	D10	–DACK5	O
C11	SD 08	I/O	D11	DRQ 5	I
C12	SD 09	I/O	D12	–DACK6	O
C13	SD 10	I/O	D13	DRQ 6	I
C14	SD 11	I/O	D14	–DACK7	O
C15	SD 12	I/O	D15	DRQ 7	I
C16	SD 13	I/O	D16	+ 5V	V_{CC}
C17	SD 14	I/O	D17	–MASTER	I
C18	SD 15	I/O	D18	0 V	GND

Under normal conditions, the signals –SBHE, LA17 – LA23, –MEMR and MEMW are operated as outputs (sending from CPU). Only CPU modules that are suitable for use as a master CPU for system bus access send and receive these signals. A minus sign, ”–”, in front of the signal name shows that the signal is LOW active.

7.6.3 Pin assignment PCI slot

The table on the next page resumes the pin assignment of the PCI slot.

	5V System Environment	
	Side B	Side A
1	–12V	TRST#
2	TCK	+12V
3	Ground	TMS
4	TDO	TDI
5	+5V	+5V
6	+5V	INTA#
7	INTB#	INTC#
8	INTD#	+5V
9	PRSNT1#	Reserved
10	Reserved	+5V (I/O)
11	PRSNT2#	Reserved
12	Ground	Ground
13	Ground	Ground
14	Reserved	Reserved
15	Ground	RST#
16	CLK	+5V (I/O)
17	Ground	GNT#
18	REQ#	Ground
19	+5V (I/O)	Reserved
20	AD[31]	AD[30]
21	AD[29]	+3.3V
22	Ground	AD[28]
23	AD[27]	AD[26]
24	AD[25]	Ground
25	+3.3V	AD[24]
26	C/BE[3]#	IDSEL
27	AD[23]	+3.3V
28	Ground	AD[22]
29	AD[21]	AD[20]
30	AD[19]	Ground
31	+3.3V	AD[18]
32	AD[17]	AD[16]
33	C/BE[2]#	+3.3V
34	Ground	FRAME#
35	IRDY#	Ground
36	+3.3V	TRDY#
37	DEVSEL#	Ground
38	Ground	STOP#
39	LOCK#	+3.3V
40	PERR#	SDONE
41	+3.3V	SBO#
42	SERR#	Ground
43	+3.3V	PAR
44	C/BE[1]#	AD[15]
45	AD[14]	+3.3V
46	Ground	AD[13]
47	AD[12]	AD[11]
48	AD[10]	Ground

	5V System Environment	
	Side B	Side A
49	Ground	AD[09]
50	CONNECTOR KEY	
51	CONNECTOR KEY	
52	AD[08]	C/BE[0]#
53	AD[07]	+3.3V
54	+3.3V	AD[06]
55	AD[05]	AD[04]
56	AD[03]	Ground
57	Ground	AD[02]
58	AD[01]	AD[00]
59	+5V (I/O)	+5V (I/O)
60	ACK64#	REQ64#
61	+5V	+5V
62	+5V	+5V
	CONNECTOR KEY	
	CONNECTOR KEY	
63	Reserved	Ground
64	Ground	C/BE[7]#
65	C/BE[6]#	C/BE[5]#
66	C/BE[4]#	+5V (I/O)
67	Ground	PAR64
68	AD[63]	AD[62]
69	AD[61]	Ground
70	+5V (I/O)	AD[60]
71	AD[59]	AD[58]
72	AD[57]	Ground
73	Ground	AD[56]
74	AD[55]	AD[54]
8	AD[53]	+5V (I/O)
76	Ground	AD[52]
77	AD[51]	AD[50]
78	AD[49]	Ground
79	+5V (I/O)	AD[48]
80	AD[47]	AD[46]
81	AD[45]	Ground
82	Ground	AD[44]
83	AD[43]	AD[42]
84	AD[41]	+5V (I/O)
85	Ground	AD[40]
86	AD[39]	AD[38]
87	AD[37]	Ground
88	+5V (I/O)	AD[36]
89	AD[35]	AD[34]
90	AD[33]	Ground
91	Ground	AD[32]
92	Reserved	Reserved
93	Reserved	Ground
94	Ground	Reserved

Assignment of slot-specific PCI bus signals

PCI Socket Pin No.	PCI Slot 1	Shared ISA PCI Slot
B16	clk (slot 1)	clk (slot2)
A6	inta#	intb#
A7	intc#	intd#
B7	intb#	intc#
B8	intd#	inta#
B18	req1	req0
A17	gnt1	gnt0
A26	ad29	ad30

7.7 Power supply (AC and DC)

Technical Data

Voltage	Max. current	Voltage stability
+12 V	2.5 A	± 4%
–12 V	0.3 A	± 5%
+ 5 V	13.5 A	± 3%
+3.3 V	8.5 A	± 3%

Voltage

Input voltage	120/230V AC +15%/–20% 24V DC +20%/–15%
Power consumption	≤ 132 Watt
Stored energy time upon power failure	20 ms at rated voltage
Maximum continual power output	105 W
Degree of protection	IP20 (when installed)
Protection class	VDE 0106
Approvals	EN 60950/IEC 950, UL/cUL1950, UL/cUL508

Power-Good-Signal

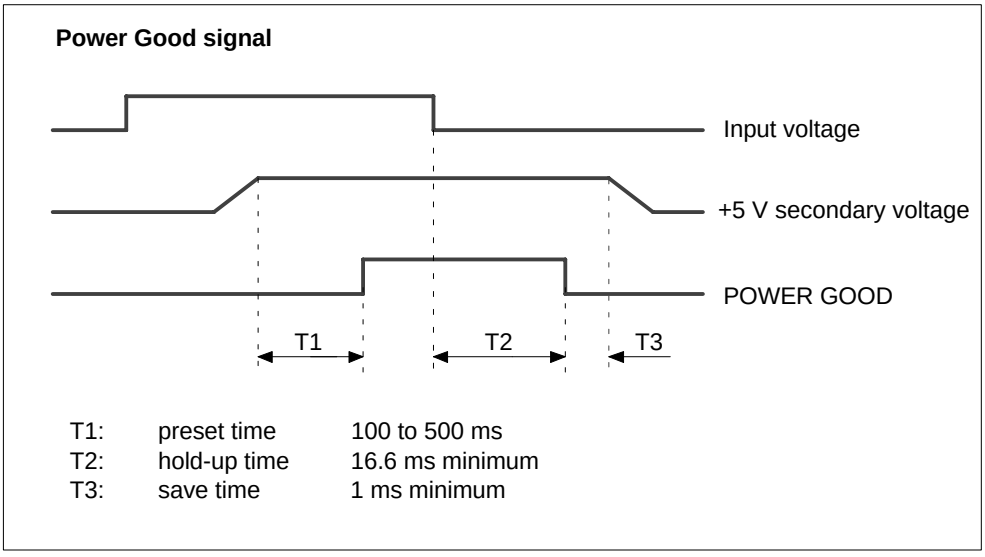


Figure 7-11 Time Characteristics of the Power Good Signal

7.8 Connecting cables

SIMATIC S5 Connecting Cable

By means of the SIMATIC S5 connecting cable (not included in all supply variants) you can connecto your computing unit with a SIMATIC S5 automation device. Please study the notes in Chapter 3.

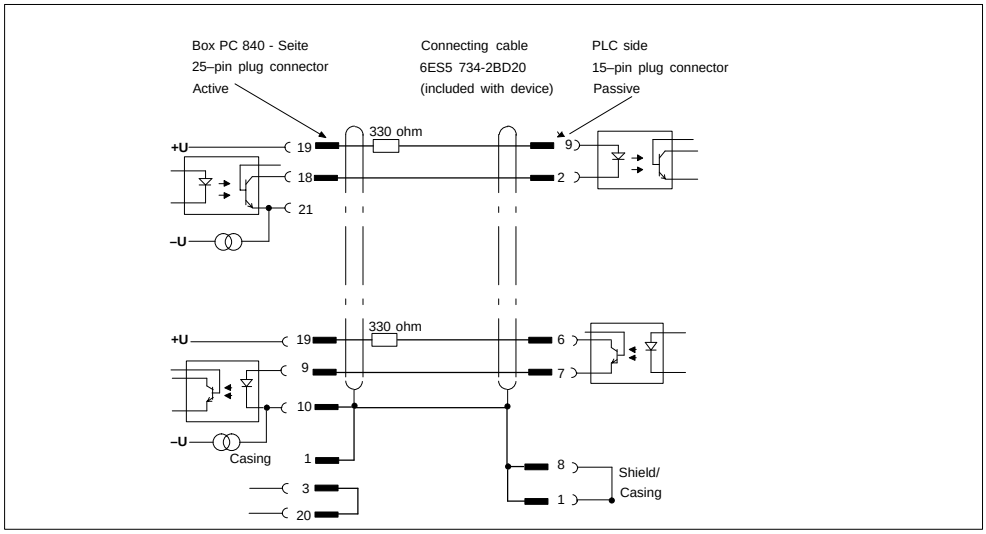


Figure 7-12 SIMATIC S5 Standard Connecting Cable

SIMATIC S7 Connecting Cable for MPI/DP

With the connecting cable 6ES7901-0BF00-0AA0 you can connect your computing unit with a SIMATIC S7 automation device. Please study the notes in Chapter 3.

Distributed configuration

8

Chapter Overview

This chapter describes all specifications of the distributed configuration that are different from those of the integrated configuration (described in chapters 2 – 7).

Where this manual focuses on the computing unit.

Note

The part of the description referring to the Remote mount of the control unit will be found in ”SIMATIC Panel PC 670/870 Control Unit” manual.

In chapter 5.1 of the manual “SIMATIC Panel PC 670/870 control unit” you will find general information about the concept of the distributed configuration.

In Section	You Will Find	on Page
8.1	Description	8-2
8.2	Cable connection	8-4
8.3	Spare parts	8-4
8.4	Technical Data	8-4

8.1 Description

8.1.1 Overview

Figure 8-1 shows a PC 670 computing unit (distributed configuration) with the transmitter fitted between mounting brackets.

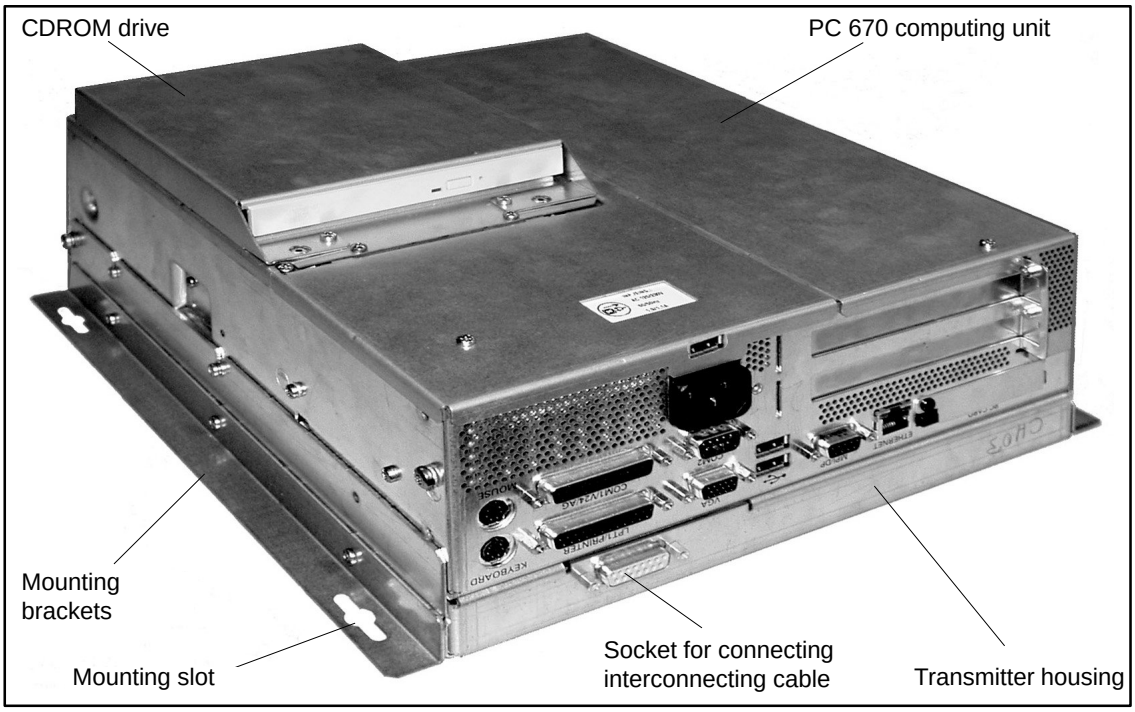


Figure 8-1 PC 670 computing unit in distributed configuration (230 V power supply) including transmitter

The transmitter boards integrated into the housing are shown in figure 8-3.

8.1.2 Dimensions

Figure 8-2 shows the dimensions of the PC 670 computing unit with transmitter.

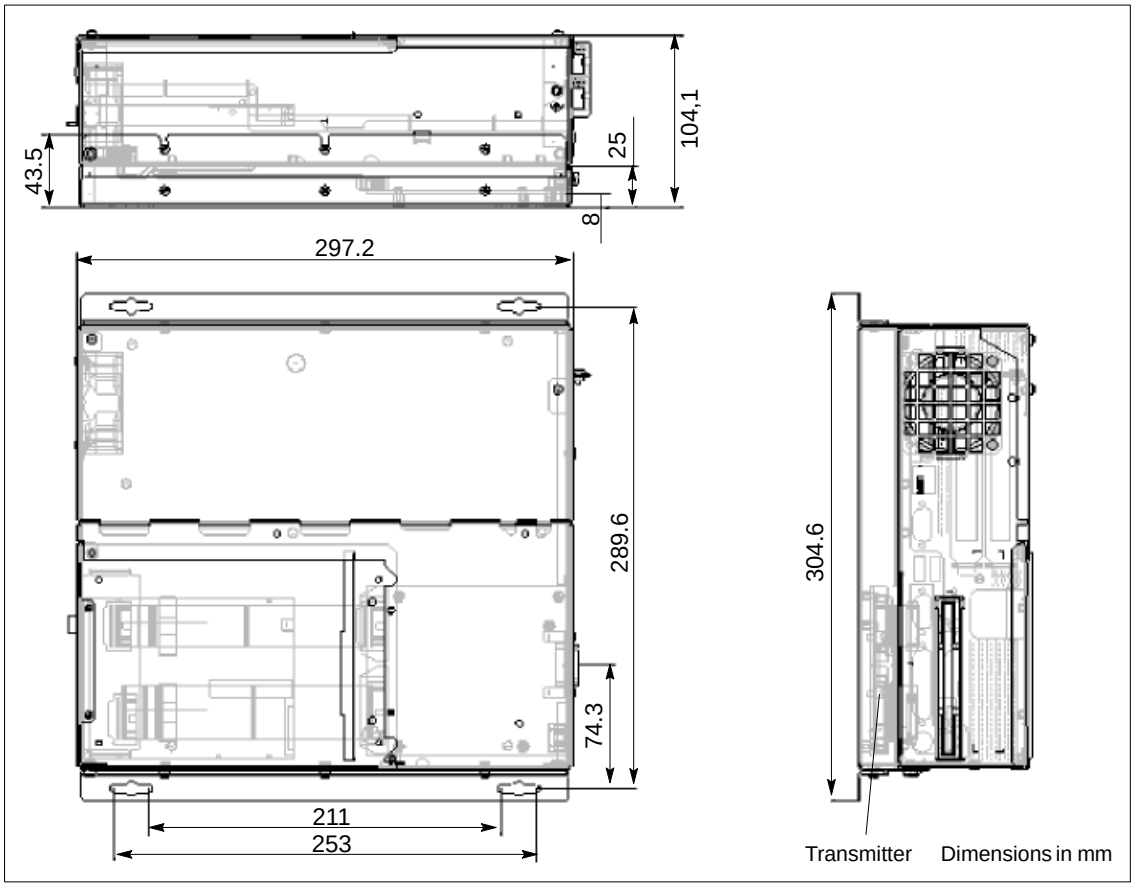


Figure 8-2 Dimensions computing unit PC 670 without CD-ROM drive in distributed configuration including transmitter

8.1.3 Mounting

The computing unit is supplied as a complete combination with the transmitter installed ex works.

The device is fitted with the help of four elongated holes in the mounting brackets (refer to Figures 8-1 and 8-2).

Mounting positions

The computing unit may be mounted in a vertical and a horizontal position (see chapter 2.2). We recommend a vertical position.

8.2 Cable connection

Transmitter and receiver are connected by a cable with a maximum length of 20 m.

For operation, the angled cable connector is inserted in the socket of the transmitter and locked.

The interconnecting cable must also be fixed in position.

For further details refer to the ”SIMATIC Panel PC 670/870 Control Unit” manual, Chapter 5.

8.3 Spare parts

The following spare parts are available:

- Conecting cable for Panel PC distributed configuration (see manual “SIMATIC Panel PC 670/870 control unit”)
- Transmitter housing with transmitter assembly and connecting cable

8.4 Technical data

Of relevance to the user, in addition to the technical specifications listed in Appendix B, are only the:

- Dimensions: see Figure 8-2.
- S30 encoder setting of the transmitter:
  the transmitter setting to the display you are using is performed before it is supplied.

Display codes

In case a control or modification of the values is necessary, follow this procedure:

1. Unscrew the computing unit from the installation wall.
2. Loosen the four outer fastening screws slightly (Figure 8-1) and and remove the two center fastening screws of the transmitter housing (Figure 8-3).
3. Remove the transmitter housing from the computing unit (there is no need to unplug the cables).

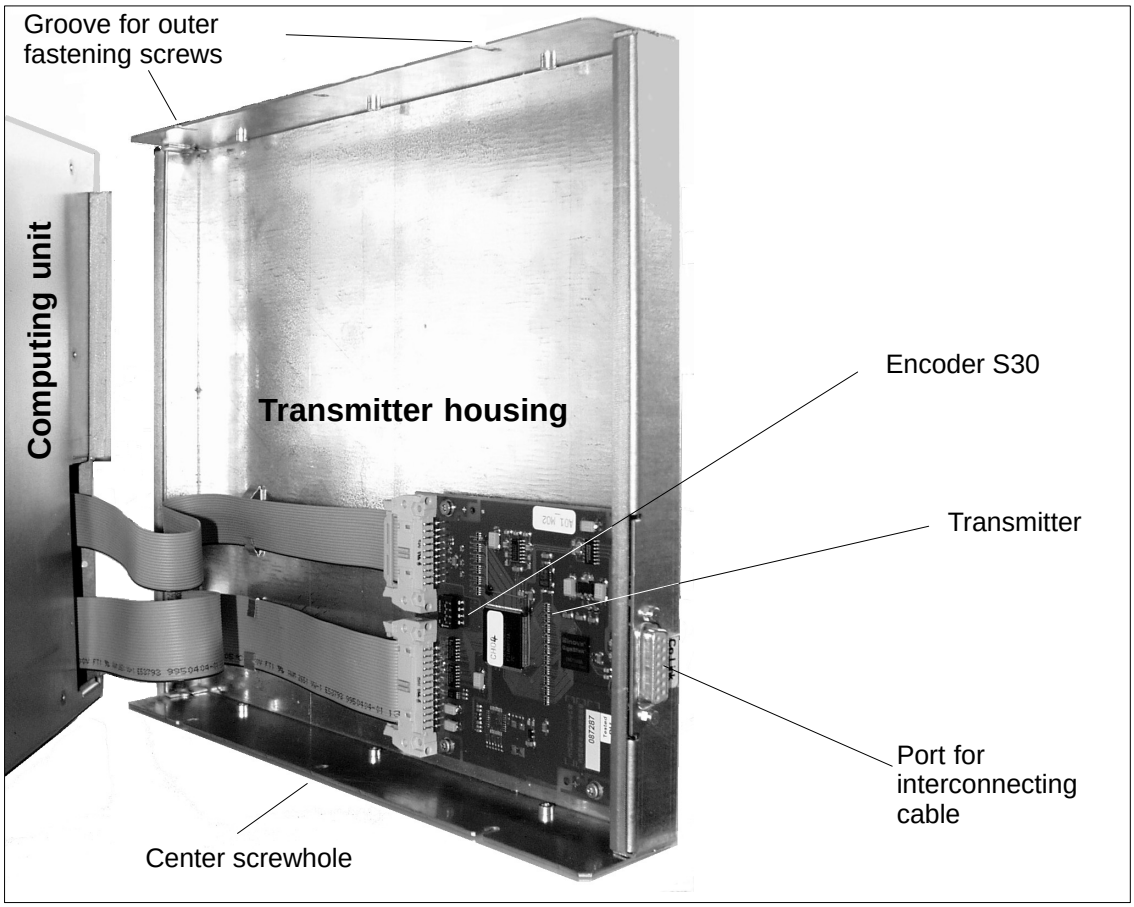


Figure 8-3 Transmitter in opened transmitter housing

4. Check (or set) the switch setting as shown in the table below:

Table 8-1 Display type adjustment via encoder S30

Type	Resolution	S30/4	S30/3	S30/2	S30/1
12” (SVGA)	800 x 600	OFF	ON	ON	ON
15” (XGA)	1024 x 768	OFF	ON	ON	OFF

5. Install in reverse order.

Technical Data

A

In this Appendix

This appendix contains the following technical specifications for the Panel PC 670 computing unit:

- General Information
- Safety
- Electromagnetic Compatibility (EMC)
- Ambient Conditions
- Mechanical environmental conditions
- Motherboard
- Drives
- Graphics card
- Interfaces
- Function displays (light-emitting diodes) on device

A.1 Technical Data of the Panel PC 670 Computing Unit

General	
Order nos.	See order documentation
Dimensions	297x267x80 (WxHxD in mm), without CD-ROM drive 297x267x101 (WxHxD in mm), with CD-ROM drive
Weight	approx. 6kg (13.5 lbs.)
Supply voltage (U_N)	120 V (85 V to 132 V (AC), or 230 V (170 V to 264 V) AC (autorange) alternative: 24 V (20.4 bis 28.8 V) DC, SELV
(Line voltage frequency, AC	50/60 Hz (47 to 63 Hz)
Short-term power interruption complying to to Namur	max. 20 ms at 0.85 U_N (max. 10 times per hour; min. recovery time 1 s)
Max. power consumption	120W
max. current output (DC), according to form of power supply	+5V/ 13,5A 3,3V/ 8,5A +12V/ 2,5A –12V/0,3A (in total max. 105W)
Noise emission	< 55dB(A) to DIN 45635
Degree of protection	IP20
Safety	
Protection class	Protection class I pursuant IEC 60536
Safety specifications with AC power supply	UL1950/IEC 60950 entspr. DIN VDE 0805, UL 508
Safety specifications with DC power supply	UL508
Electromagnetic compatibility (EMC)	
Emitted interference with power supply 105W	EN 55022 Class A (requirement for industrial sector) for devices with AC power supply EN6100-3-2 class D and EN61000-3-3
Emitted interference with power supply 85W	EN 55022 Class B (requirement for domestic and industrial sector) for devices with AC power supply EN6100-3-2 class D and EN61000-3-3
Noise immunity: Mains borne disturbance variables on supply lines	± 2 kV (to IEC 61000-4-4; Burst) ± 1 kV (to IEC 61000-4-5; Surge symm) ± 2 kV (to IEC 61000-4-5; Surge unsymm)
Noise immunity on signal lines	± 1 kV (IEC 61000-4-4; Burst; length < 5 m) ± 2 kV (IEC 61000-4-4; Burst; length > 5 m) ± 2 kV (to IEC 61000-4-4:1995; Surge unsymm; length > 30 m)
Noise immunity to discharges of static electricity	± 6 kV contact discharge (to IEC 61000-4-2) ± 8 kV discharge in air (to IEC 61000-4-2)
Noise immunity to high-frequency radiation	10 V/m 80-1000 MHz, 80% AM (to IEC 61000-4-3) 10 V/m 900 MHz and 1,89 GHz, 50% ED (to IEC 61000-4-3) 10 V 9KHz- 80MHz (to IEC 61000-4-6)
Magnetic field	30 A/m 50Hz (to IEC 61000-4-8)

Environmental conditions	
Temperature	tested to DIN EN 60068-2-2:1994, DIN IEC 60068-2-1, DIN IEC 60068-2-14,
– operation	+5 °C to +45 °C
– storage/transport	- 20°C to +60°C
– gradient	max 10°C/h (no condensation)
Relative humidity	tested to DIN IEC 60068-2-3, DIN IEC 60068-2-30, DIN IEC 60068-2-56
– operation	5% to 80% at 25°C (no condensation)
– storage/transport	5% to 95% at 25°C (no condensation)
– gradient	max 10°C/h (no condensation)
Mechanical environmental conditions	
Vibration *)	tested to DIN IEC 60068-2-6
– operation	10 to 58 Hz: 0.075 mm, 58 to 500 Hz: 9.8 m/s^2
– storage/transport	5 to 9 Hz: 3,5 mm, 9 to 500 Hz: 9.8 m/s^2
Shock	tested to DIN IEC 60068-2-29
– operation	50 m/s^2, 30 ms,
– storage/transport	250 m/s^2, 6 ms,
Special Features	
Quality assurance	to ISO 9001
Mainboard	
Processor	Intel Pentium III / Celeron (see order documentation)
Internal processor cache	2x 16KB first level, 128/256/512 KB second level, dependent on the processor used
Main memory	maximum 512 MB SDRAM, memory configuration (see order documentation)
2. Level Cache	Processor internal
Free expansion slots	1 shared ISA/PCI (max 175 mm long), 1 PCI (max 265mm long)
– max. permissible current input per ISA slot	5V 2A, 12V 0.3A, -12V 0.1A
– max. permissible current input per PCI slot	5V 2A, 12V 0.3A, -12V 0.1A
– in total (all slots)	5V 3A, 12V 0.6A, -12V 0.15A may not be exceeded
Drives	
Floppy disk/LS240 drive	3.5” (1.44 MB) / 3.5” (240 MB, 120 MB or 1.44 MB)
Hard disk	3,5”, EIDE, UDMA33, hard disk capacity (see order documentation)
CD-ROM-/CD-RW-/DVD(Combo) drive	650 MB / 4.7 GB

*) Restrictions for LS 240 with 120/240 MB data carrier and CD ROM /CD RW /DVD
10 to 58 Hz: 0.019 mm, 58 to 500 Hz: 2.5 m/s^2

Graphic	
Graphic controller	UXGA LCD controller on the AGP bus
Graphic store	bis zu 32 MB SDRAM sind Bestandteil des Hauptspeichers und können konfiguriert werden (8/16/32MB)
Resolutions/frequencies/colors	CRT: up to 1600x1200/85 Hz / 65536 colors with PC133 up to 1280x1024/85 Hz / 65536 colors with PC100 memory modules
Interfaces	
COM 1	Serial port 1 (V.24 / TTY), 25 pin subminiature Cannon connector
COM 2	Serial port 2 (V.24), 9 pin subminiature Cannon connector
LPT1	Parallel port (standard, EPP and ECP modes) Interface for printer with parallel port
VGA	VGA port, connection for external monitor
Keyboard	PS/2 keyboard connection
Mouse	PS/2 mouse connection
USB	3 channels (1x internal, 2x external)
Card bus	1 port (max. type III)
DP12 port, potentially isolated • Transfer rate • Mode • Physical interface • Memory address area • Interrupts	9-pin sub D socket connector, screw-type locking • 9,6 kBaud to 12 Mbaud, configurable by SW • potentially isolatedt*3: data lines A, B control lines RTS AS, RTS_PG - 5V voltage supply (max. 90 mA) • ground connection: - shield of the DP12 connecting line • RS485, potentially isolatedt*3 • 0CC000h ...0CC7FFh or 0DC000h ...0DC7FFh • IRQ5, 10, 11 or 15 configurable by SW
Ethernet	Ethernet port (RJ45)
Function displays (light-emitting diodes) on device	
Computing unit SIMATIC Panel PC 670	FD/LS240 access (on FD/LS240 drive on the side of the computer box) CD ROM access (on CD ROM drive, if installed)

*3 Electrical isolation through an extra-low voltage safety circuit (SELV)

ESD Guidelines

B

Chapter Overview

In chapter	You Will Find	on Page
B.1	What does ESD mean?	B-2
B.2	Electrostatic charge of people	B-3
B.3	Basic safety measures against discharge of static electricity	B-4

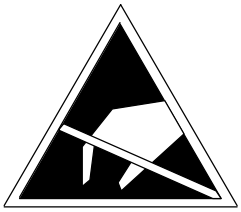
B.1 What does ESD mean?

Definition

All electronic components are equipped with high-integrated modules or components. Conditioned by their technology, these electronic components are extremely sensitive to overvoltages and therefore to discharges of static electricity.

These **E**lectrostatically sensible components/assemblies are internationally known under the abbreviation as **ESD**. At the same the internationally used denomination **ESD** for **e**lectrostatic **s**ensitive **d**evice is also used.

Electrostatic sensitive assemblies are identified by the following symbol:



Caution

Electrostatic sensitive devices can be destroyed by voltages which are far below the limit of perception of human beings. These voltages occur when you touch a component or the electrical connections of a assembly without being electrostatically discharged. The damage which arises in a assembly as a result of overvoltage cannot usually be detected immediately, but only becomes apparent after a lengthy operating period.

B.2 Electrostatic Charge of People

Charging

Anyone who is not conductively connected to the electrical potential of their surroundings can be electrostatically charged.

The maximum electrostatic voltage values which an operator can be charged with when contacting the materials stated in the illustration are shown in Fig. B-1. These values correspond to the specifications of IEC 801-2.

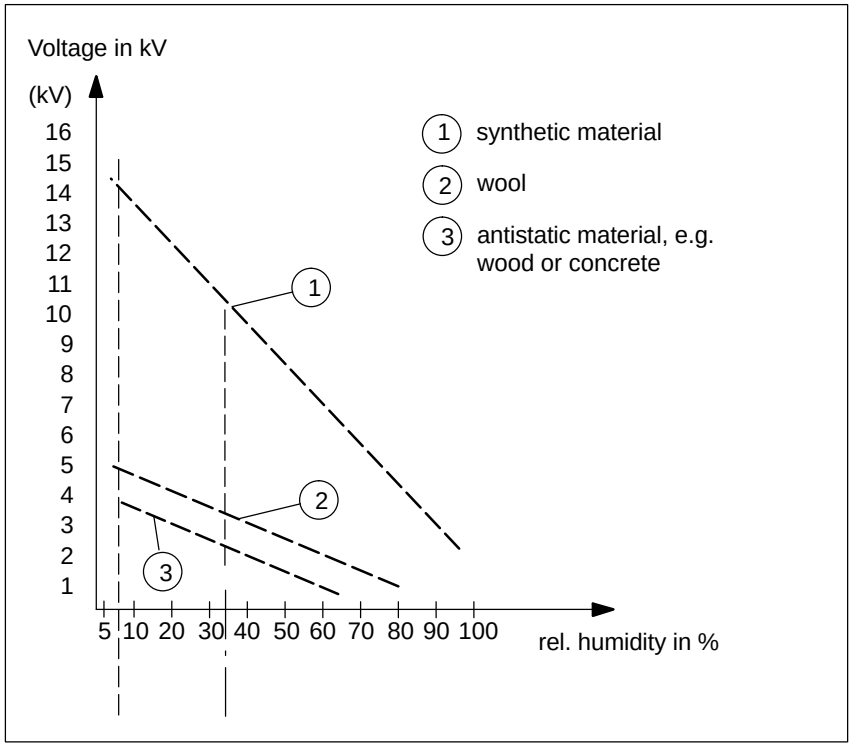


Figure B-1 Electrostatic voltages which an operator can be charged with

B.3 Basic Safety Measures against Discharge of Static Electricity

Ensuring a good ground connection

When handling electrostatic sensitive devices, ensure that your person, the workplace and packaging are grounded. In this manner you avoid static charge.

Avoid direct contact

As a general principle, only touch electrostatic sensitive devices when this is unavoidable (e.g. during maintenance work). To prevent discharge energy from reaching and damaging sensitive components, hold the components in such a way that you do not touch the pins or the printed conductors.

If you have to perform measurements on an assembly, discharge your body by touching a grounded metallic object before carrying out the work. Use only grounded measuring instruments.

SIMATIC HMI Documentation

C

Target groups

This manual is part of the SIMATIC HMI documentation. The documentation is aimed at the following target groups:

- Newcomers
- Users
- Configurers
- Programmers
- Commissioning engineers

Structure of the documentation

The SIMATIC HMI documentation consists of the following components:

- User's Guides for:
  - Configuration software
  - Runtime software
  - Communication between PLCs and operating units
- Equipment Manuals for the following operating units:
  - SIMATIC Panel PC
  - MP (Multi Panel)
  - OP (Operator Panel)
  - TP (Touch Panel)
  - TD (Text Display)
  - PP (Push Button Panel)
- Online Help on the configuration software
- Start-up Guides
- First Steps

Overview of complete documentation

The following table provides an overview of the SIMATIC HMI documentation and shows you when you require the different documents.

Documentation	Target Group	Content
First Steps with ProTool Product Brief	Newcomers	This documentation guides you step by step through the configuration of • a screen with various objects • a change of display and • a message. This documentation is available for: • Text-based Displays • Graphics Displays • Windows-based systems
ProTool Configuring Windows-based systems User's Guide	Configurers	Contains information about the configuration software for: • Installation, • Basic configuration and • detailed description of configurable objects and functions. This documentation is valid for all Windows-based systems.
ProTool Configuring Graphics Displays User's Guide	Configurers	Contains information about the configuration software for: • Installation, • Basic configuration and • detailed description of configurable objects and functions. This documentation is valid for graphic display operating units.
ProTool Configuring Text-based Displays User's Guide	Configurers	Contains information about the configuration software for: • Installation, • Basic configuration and • detailed description of configurable objects and functions. This documentation is valid for text-based display operating units.
ProTool Online Help	Configurers	Contains information on the configuration computer while working with ProTool. The Online Help consists of: • Direct help • Detailed procedures and examples • Detailed information • All information of the user manual
ProTool/Pro Runtime User's Guide	Commissioning engineers, Users	Describes the installation of the visualization software ProTool/Pro RT as well as the installation and operation of the software on Windows-based systems.

Documentation	Target Group	Content
Copy Protection Start-up Guide	Commissioning engineers, Users	The ProTool/Pro Runtime visualization software is a copyright product. This manual contains information on the installation, repair and uninstallation of authorizations.
Application Example Start-up Guide	Newcomers	ProTool is supplied with example configurations and the corresponding PLC programs. This documentation describes how you • load the examples onto the operating unit and PLC • use the examples and • upgrade the connection to the PLC to suit your own specific application.
SIMATIC Panel PC 670 Computing Unit SIMATIC Panel PC 870 Computing Unit SIMATIC Panel PC IL Computing Unit	Commissioning engineers, Users	Describes the computer and control unit of the SIMATIC Panel PC 670 and the SIMATIC Panel PC 870 as well as of the SIMATIC Panel PC IL.
Device manuals MP 370 MP 270 MP 270B, OP 270, TP 270 TP 170B, OP 170B TP 170A TP 070	Commissioning engineers, Users	Describes the hardware and the general operation of Windows-based devices: • Installation and commissioning instructions • Unit Description • Operation • Instructions for connecting the PLC, printer and programming computer, • Maintenance
OP37/Pro Computing Unit	Commissioning engineers, Users	Describes the hardware, installation and inclusion of upgrades and options for the OP 37/Pro.
TP 27, TP 37 Computing Unit OP 27, OP 37 Computing Unit OP 25, OP 35, OP 45 Computing Unit OP7, OP17 Computing Unit OP5, OP15 Computing Unit TD17 Computing Unit	Commissioning engineers, Users	Describes the hardware and general operation. It contains • installation and commissioning instructions • a description of the equipment • instructions for connecting the PLC, printer and programming computer, • operating modes • operating instructions • description of the standard screens supplied with the operating unit and how to use them • fitting options • maintenance and fitting of spare parts.
OP 3 Computing Unit	Commissioning engineers, Users, Programmers	Describes the hardware of the OP 3, the general operation and the connection to the SIMATIC S7.
PP7, PP17 Computing Unit	Commissioning engineers, Users	Describes the hardware, installation and commissioning of the Push Button Panel PP 7 and PP 17.

Documentation	Target Group	Content
Communication User's Guide	Programmers	Contains information on connecting line- and graphic-based control panels to the following controls: • SIMATIC S5 • SIMATIC S7 • SIMATIC 500/505 • drivers for other PLCs This documentation describes the • configuration and parameters required for connecting the devices to the PLC and the network • user data areas used for exchanging data between operating unit and PLC.
Communication for Windows-based systems User's Guide	Programmers	Contains information on connecting Windows-based systems to the following controls: • SIMATIC S5 • SIMATIC S7 • SIMATIC WinAC • SIMATIC 505 • Integration in SIMATIC iMap • SIMOTION • drivers for other PLCs This documentation describes the • configuration and parameters required for connecting the devices to the PLC and the network • user data areas used for exchanging data between operating unit and PLC.
Other PLCs Online Help	Programmers	Contains information on connecting control units to the OPC and to the controls of: • Allen Bradley • GE Fanuc • Lucky Goldstar GM • Mitsubishi • Modicon • Omron • Telemecanique When the drives are installed, the relevant Online Help is installed at the same time.
ProAgent for OP User's Guide ProAgent/PC and ProAgent/MP User's Guide	Configurers	Contains the following information on the option package ProAgent (process diagnosis): • configure installation-specific process diagnosis • detect process errors, find the cause of an error and correct error • adjust the supplied diagnosis figures to user requirements

Glossary

A

APM

Advanced Power Management.

Application

An application is a program directly linked to the MS-DOS or Windows operating system. Applications on SIMATIC PCs are, for example, the visualization packages SIMATIC ProTool/Pro, SIMATIC WinCC and others.

Automation system (AS)

A controller in the SIMATIC S7 series (for example, SIMATIC S7-200/300/400).

C

Cache

Buffer between working memory and central processing unit.

COM1 port

Serial V.24/modem port, 25-pin, sub-D connectors, sockets. The port is suitable for asynchronous data transmission. It can also be used to connect printers having a serial interface.

COM2 port

Serial V.24 port, 9-pin, sub-D connectors, pins. Preferred for connecting a mouse of other external devices (for example, a printer).

Configuration file

Contains data which define the appearance of a configuration following a complete restart. These files are e.g. register files.

Configuration software

Configuration software updates the device configuration when modules are fitted. This is done either by copying the configuration files supplied with the device of by manual configuration.

D

Device configuration

The device configuration of a SIMATIC PC contains details about its features and options such as memory capacity, drive types, monitor, network address, etc. The data are stored in a configuration file and are used by the operating system to select the correct drivers and device parameters.

When the basic configuration changes, the user can modify the settings using a program that configures the system (SETUP).

Drivers

Program parts of the operating system. They convert the data of applications into specific formats required by the peripheral devices (for example, hard disks, monitors, printers).

E

Ethernet port

For connecting a local area network (bus structure) for text and data communications at a data transfer rate of 100 Mbaud.

Expanded memory

Expansion memory modules can be installed to expand the default working memory of a SIMATIC PC.

I

Interface module

Module for connecting hardware I/O.

Interface, multipoint

The multipoint interface (MPI) is the SIMATIC PC interface to the SIMATIC S7/M7. This enables programmable modules, (module, programmable), text displays and operator panels to be reached from a central point. The nodes on the MPI can communicate with each other.

Interrupt

Discontinuation in the processor of a programmable controller by an interrupt event.

IRQ

Interrupt request.

ISA

Industrial Standard Architecture (bus for expansion board)

K

Keyboard port

PS/2 keyboard connector Keyboards with an integrated trackball can be connected.

L

LPT 1 port

The LPT 1 port (Centronics interface) is a parallel interface which can be used for attaching a printer.

LS 120 drive

The LS 120 drive is compatible with the familiar 3.5” floppy disk drive. The LS 120 drive supports both standard floppy disks (1.44 MB) and superdisks with a capacity of up to 120 MB.

M

Main memory

Main memory is the whole RAM on a SIMATIC PC.

Motherboard

The motherboard is the heart of SIMATIC PCs. Data are processed and saved from here, and interfaces and device peripherals are controlled and managed.

Mouse port

PS/2 mouse connector.

MPI/DP port

(Multi-Point-Interface/Profibus-DP) for connecting an S7 programmable controller.

P

Parallel port

Information is transferred on a byte by byte basis through a parallel port. High data transfer rates are achieved as a result. SIMATIC PCs have one parallel port (LPT) for attaching a printer.

PC card interface

For connecting PC cards (types I/II/III).

PCI or PCI/ISA slot

(Peripheral Component Interconnect) for expansion boards.

PCMCIA

(Personal Computer Memory Card International Association). Association of computer manufacturers formed with the aim of defining an international standard for memory modules and PC expansion cards. Cooperates with JEIDA.

Port, parallel

Information is transferred on a byte by byte basis through a parallel port. High data transfer rates are achieved as a result. SIMATIC PCs have one parallel LPT1 port.

Port, serial

Data are transferred bit by bit through serial ports. They are used in instances where large distances have to be traversed with minimum cabling.

Printer interface

Parallel port, 25-pin, sub-D connectors, sockets. For attaching printers.

Programmable logic controller (PLC)

A controller in the SIMATIC S5 series (for example, AG S5-115U/135U).

R

RTC

Real time clock

S

SCSI interface

Small Computer System Interface. Interface for connecting SCSI devices (for example, hard disks, CD-ROM drives)

SETUP (BIOS Setup)

A program which defines information about the device configuration. The device configuration of the SIMATIC PC is preset. Changes have to be made when a memory expansion module, new modules or drives have to be activated.

T

TFT display

Thin-film transistor color display

U

USB port

(Universal Serial Bus) for connecting devices to the USB port.

V

V.24 interface

The V.24 interface is a standard interface for data transmission, and printers, modems, etc. can be connected to it.

VGA port

(Video Graphics Array) for connecting an external monitor, 15-pin, sub-D connectors, sockets.

W

Warm restart

By warm restart we mean a restart after a program abort. The operating system is reloaded and started. A warm restart is performed by pressing the keys CTRL+ ALT+ DEL.

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